DOCUMENT RESUME

ED 138 781 CE 011 025

AUTHOR	Kase, Suzanne H.; Swenson, Betty
TITLE	Costs of Hospital-Sponsored Orientation & Inservice Education for Registered Nurses.
INSTITUTION	Health Resources Administration (DHEW/PHS), Bethesda, Md. Div. of Nursing.
REPORT NO	DHEW-HRA-77-25
PUB DATE	Nov 76
CONTRACT	NO1-NU-34082
NOTE	172p.; Appendices may be marginally legible due to print quality of original
AVAILABLE FROM	Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402 (Stock Number 017-041-00123-8, $2.50)
EDRS PRICE	MF-$0.83 HC-$8.69 Plus Postage.
DESCRIPTORS	Cost Effectiveness; Educational Background; Hospital Personnel; *Hospitals; *Inservice Education; Inservice Programs; National Surveys; *Nurses; *Program Costs; *Staff Orientation
IDENTIFIERS	United States

ABSTRACT

A nationwide survey sought to analyze hospital orientation and inservice education programs to determine their nature and costs with focus on differences in orientation costs for new nurses with three different types of preparation (diploma, associate degree (AD), and baccalaureate) and for cost differences in hospitals of varying sizes. Information was secured through a questionnaire to a representative national sample of short term, nonfederal general hospitals. Retrospective data were supplied by a stratified random sample of 394 hospitals (a total of 998 nonfederal acute care hospitals received questionnaires) in order to make projections to the designated population of 5,865 hospitals. The total national cost of in hospital education is estimated to be $226 million (60% for orientation and 40% for inservice education). Average total costs per sample hospital were figured as well as costs per new nurse for orientation and inservice education. Only direct salary components of the costs were computed, both for training staff and for recipients of the training. In the smaller hospitals the combined cost for inhospital education averaged $11,034 per year and $1.02 per patient day; in the largest these costs were $210,412 and $.95 respectively. AD graduates generally averaged more hours of clinical unit orientation than either diploma or baccalaureate graduates. Average salary costs for training staff for both orientation and inservice ranged from $7,176 in the smaller hospitals to $80,062 in the largest. (LAS)

Documents acquired by ERIC include many informal unpublished materials not available from other sources. ERIC makes every effort to obtain the best copy available. Nevertheless, items of marginal reproducibility are often encountered and this affects the quality of the microfiche and hardcopy reproductions ERIC makes available via the ERIC Document Reproduction Service (EDRS). EDRS is not responsible for the quality of the original document. Reproductions supplied by EDRS are the best that can be made from the original.

ED138781

Costs of Hospital-Sponsored Orientation & Inservice Education for Registered Nurses

Suzanne H. Kase, RN, Project Director
Betty Swenson, RN

U S DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION
THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

November 1976

HEALTH MANPOWER REFERENCES

DHEW Publication No. (HRA) 77-25

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
PUBLIC HEALTH SERVICE ■ HEALTH RESOURCES ADMINISTRATION
BUREAU OF HEALTH MANPOWER ■ DIVISION OF NURSING
BETHESDA, MARYLAND 20014

OE 011 025

DISCRIMINATION PROHIBITED: Under provisions of applicable public laws enacted by Congress since 1964, no person in the United States shall, on the ground of race, color, national origin, sex, or handicap, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance. In addition, Executive Order 11141 prohibits discrimination on the basis of age by contractors and subcontractors in the performance of Federal contracts. Therefore, the nursing manpower analysis and planning program must be operated in compliance with these laws and executive order.

The study upon which this publication is based was supported under Contract Number NO1-NU-34082 from the Division of Nursing, Health Resources Administration.

Division of Nursing project officer is Evelyn Moses, Statistician, Manpower Analysis and Resources Branch.

For sale by the Superintendent of Documents, U.S. Government Printing Office
Washington, D.C. 20402 - Price $2.50

Stock No. 017-041-00128-8

FOREWORD

It is generally recognized that new entrants in all occupations both in and out of the health field, as well as those changing their positions, need orientation to the work situation and the particular employment setting in which they find themselves. While there is little data available on overall employer's costs for these activities, with current concerns over the costs of hospital care, the Division of Nursing thought it appropriate to ascertain the impact of such costs to hospitals for orientation and inservice education of nurses.

As nursing education moves away from hospitals and into collegiate settings, patients are being relieved of the costs of nursing education. At the same time, hospitals and other agencies are concerned with a supposedly growing need to provide extensive orientation for newly graduated nurses or for nurses returning to employment after a period of inactivity. In addition, continuing education is increasing in importance in this time of rapid changes in health care science and technology. Under certain provisions for accreditation or for Medicare eligibility, hospitals are being required to provide inservice education for nurses on their staffs.

Furthermore, opinions have been widely expressed that graduates of the traditional 3-year diploma schools require the least amount of orientation to a hospital setting job and that the 2-year associate degree program graduates and baccalaureate degree program graduates may require considerable job orientation. It is also felt that there may be varying requirements for inservice or continuing education among the three types of graduates. However, no factual information has existed as to whether or not there are differing needs, nor how such needs are being met.

Through a contract with Arthur D. Little Incorporated, the Division of Nursing sought an analysis of hospital orientation and inservice education programs to determine their nature and costs. Information was secured through a questionnaire to a representative nationwide sample of short-term non-Federal general hospitals.

This report contains the results of that survey. It represents a first attempt to delineate such costs and to determine the extent to which the training needs vary for nurses from the three types of educational programs. Despite the recognized difficulties in separating and reporting the various cost elements in their programs, the response from hospitals has supplied a valuable beginning to an understanding of the nature and costs of orientation and inservice education.

Jessie M. Scott
Assistant Surgeon General
Director
Division of Nursing

ACKNOWLEDGMENTS

We wish to thank all of the respondents who took the time to search their records and to write comments and suggestions.

Appreciation of their thoughtful efforts is extended to the members of the Advisory Committee whose suggestions and comments helped in design of the study and in interpretation of some of the results.

Our project officer, Ms. Evelyn Moses, made valuable suggestions and kept us "honest" and the other members of the review panel, Ms. Dolores LeHoty and Dr. Mary S. Hill, offered both encouragement and constructive criticism.

Others who contributed to this effort were: Ms. Elaine Israel, Ms. Ellen Metcalf and Ms. Barbara Millen - questionnaire design and coding; Dr. Irwin Miller, Ms. Laura Fallon and Dr. Harry Wolfe - statistical inference; Ms. Shirley Kasten and Ms. Claire Campo, registered nurses, interpretation and editing of questionnaires; and, Ms. Jackie Felder - extensive technical assistance.

Special thanks go to Ann Venable for extensive editing and overall organization of the report and to Rhonda Bates for keeping files and records in order as well as providing secretarial expertise.

The report was written by Suzanne Kase, RN, Project Director, and Betty Swenson, RN.

ADVISORY COMMITTEE FOR THIS PROJECT

Evelyn Moses - Project Officer
Bethesda, MD

Ralph Berry
Harvard School of
Public Health
Cambridge, MA

Dorothy Corey
Acting Director
Division of Nursing
American Hospital Association
Chicago, IL

Laura Fallon, ADL
Statistician

Suzanne Kase, ADL
Consultant

Jack Kasten, ADL
Vice President

Janet Kramel
Budget Control Officer
University Hospitals of
Cleveland
Cleveland, OH

Dr. Irwin Miller, ADL
Vice President

Mary Peters
Director of Nursing
Sancta Maria Hospital
Cambridge, MA

Paul Rodliff
Associate Director of
Fiscal Affairs
Beth Israel Hospital
Boston, MA

Sheila Smith
Assistant Director of
Nursing for Staff Education
Carney Hospital
Boston, MA

Betty Swenson, ADL
Consultant

Dr. Harry Wolfe, ADL
Consultant

Sharon Yenney
Hospital Research and
Education Trust
American Hospital Association
Chicago, IL

ABSTRACT

This pioneering study was conducted to estimate the total national cost of in-hospital education (orientation and inservice teaching). The design included analysis for differences in orientation costs for new nurses with three different types of preparation (diploma, Associate Degree, and baccalaureate) and for cost differences in hospitals of varying sizes.

Retrospective data were supplied by a stratified random sample of 394 hospitals (a total of 998 nonfederal acute care hospitals received questionnaires) in order to make projections to the designated population of 5,865 hospitals. The total national cost of in-hospital education is estimated to be $226 million; $135 million, or 60%, is for orientation and $91 million, or 40%, is for inservice education.

Average total costs per sample hospital are presented as well as costs per new nurse for orientation and inservice education. Only direct salary components of the costs are presented, both for training staff and for recipients of the training. In the smaller hospitals in our sample (under 100 beds), the combined cost for in-hospital education averaged $11,034 per year and $1.05 per patient day. In the largest hospitals (over 500 beds), these costs were $210,412 and $.95 respectively.

AD graduates generally averaged more hours of clinical unit orientation (hence more salary cost) than either diploma graduates or baccalaureate graduates. For AD graduates the average annual salary cost for orientation ranged from $494 in small hospitals to $906 in large hospitals; for diploma graduates the range was from $316 to $739, and for BA/BA graduates it was from $314 to $857. These figures are for orientee salary costs only.

Average salary costs for training staff for both orientation and inservice were calculated from the sample data; they ranged from $7,176 in the smaller hospitals to $80,062 in the largest.

CONTENTS

	Page
Foreword	iii
Acknowledgments	iv
Advisory Committee	v
Abstract	vi
List of Tables	viii
List of Figures	ix
I. INTRODUCTION	1
A. STANDARDS FOR IN-HOSPITAL EDUCATION OF NURSES	1
B. NATURE AND TYPES OF PROGRAMS	
C. EDUCATIONAL PREPARATION OF REGISTERED NURSES	5
D. OBJECTIVES AND SCOPE OF THIS STUDY	8
II. METHODOLOGY	9
A. LITERATURE REVIEW	9
B. QUESTIONNAIRE SURVEY	9
C. ANALYSIS OF THE DATA	19
D. EVALUATION OF THE METHODOLOGY	23
III. FINDINGS	27
A. ORIENTATION, INSERVICE EDUCATION, AND COMBINED COSTS PROJECTED TO ALL HOSPITALS	27
B. COST PROJECTIONS FROM BIAS SAMPLE	30
C. DETAILED COST FINDINGS, STUDY SAMPLE	32
D. REGRESSION ANALYSIS	54
E. OTHER FINDINGS	56
F. RECOMMENDED AREAS FOR FURTHER STUDY	61
APPENDICES	
APPENDIX A: LITERATURE REVIEW	65
APPENDIX B: QUESTIONNAIRES AND COVER LETTERS	79
APPENDIX C: STATISTICAL ANALYSIS AND RESULTS	119
APPENDIX D: CROSSTABS TABLES	153

LIST OF TABLES

Table No.		Page
1	Graduations from Initial Programs of Nursing Education for RNs in the United States and Outlying Areas	6
2	Hospital Population Studied: Stratification by Size Group	12
3	Hospital Population Studied: Stratification by Census Region	13
4	Questionnaires Mailed, Usable Responses, and Usable Responses as Percent of Mailing	14
5	Estimated Total and Mean Costs for Orientation and Inservice Education	29
6	Comparison of Results from Original Sample and Follow-up Sample to Test for Bias of Nonresponse	31
7	Summary of Sample Data and Cost Estimates	33
8	Average Hourly Starting Salaries, All Newly Hired RNs, by Size Group and Region	36
9	Summary of Orientation Hours and Costs, All Regions, by Size Group	39
10	Average Number of Newly Hired RNs per Sample Hospital, by Basic Preparation and Experience	42
11	Average Total Orientation Hours per New Nurse, by Basic Preparation and Experience	44
12	New RN Hourly Starting Salaries by Type of Preparation and Hospital Size Group	51
13	Average Annual Salary Costs for Participants and Training Staff in Inservice Programs	53
14	Size of Inservice Department Budget	58
15	Average Percent Source of Hospital Revenue by Size Group	60

LIST OF FIGURES

Figure No.		Page
1	The Survey Process	10
2	Total Estimated Costs for Orientation and Inservice Combined: 226 Million Dollars	28
3	Average Combined Cost of Orientation and Inservice Education per Patient Day, by Hospital Size Group and by Region	35
4	Training Staff Hours and New Nurse Hours for Orientation: All Newly Hired RNs, All Regions	40
5	Direct Salary Costs for Orientation: All Newly Hired RNs, All Regions	41
6	Percent of Newly Hired Nurses per Sample Hospital by Preparation and Experience	46
7	Comparison of Orientation Hours for Inexperienced Nurses, by Type of Preparation	48
8	Comparison of Orientee Salary Costs for Orientation of Inexperienced Nurses, by Type of Preparation	49

I. INTRODUCTION

This study has been conducted under the auspices of the Manpower Evaluation and Planning Branch, Bureau of Health Resources Development, Health Resources Administration, to estimate the costs to hospitals of providing orientation and inservice education for registered nurses and to determine whether costs vary according to the type of initial preparation (Associate Degree, diploma, or baccalaureate) received by RNs.

Although there has been much discussion of the purpose and content of in-hospital education, very little has been known about its costs. As discussed later, we found that many hospitals do not even have an overall budget allocation for it. A number of industrial engineering studies of hospital activities were conducted by the American Nurses' Association during the 1950s, and there have been more recent studies by others; for example, St. Joseph's Hospital in Milwaukee, Wisconsin, conducted an activity study in 1972 which included education as one of nine major activity categories studied.[1] However, the focus of these studies is on time and motion, not costs.

A. STANDARDS FOR IN-HOSPITAL EDUCATION OF NURSES

Professional, accrediting, and licensing organizations have developed standards and guidelines for providing orientation and inservice education for nurses in hospitals in order to ensure quality of nursing care. The American Nurses' Association, the Joint Commission on Accreditation for Hospitals, Medicare, and the American Hospital Association all state positions on this subject.

1. Nursing Organizations

In the 1950s, a special joint committee of the American Nurses' Association defined functions of and standards for nursing. These include planning for and participation in the continuous learning experience of nursing personnel. Standard No. 9 of ANA Standards for Organized Nursing Services is concerned with nurse training and staff development and states the following criteria for evaluating these activities:

- Training programs are provided for auxiliary nursing personnel to enable them to acquire needed knowledge and skills and to help them adjust to their new environment.
- Programs for staff development utilize educational resources inside and outside the health care facility.

---

[1] See M. Naber, "Report on Study of Nursing Personnel Activity," Bulletin of the Wisconsin Nurses Association, Vol. XXXXI, No. 6, June 1972.

- Selected staff members are encouraged to prepare themselves for greater responsibility in nursing.

- Plans are developed in advance to prepare selected personnel to function in new or expanded nursing care programs.

- Staff members are encouraged to develop avocational interests and aptitudes.

- The health care facility provides a library of books and current periodicals which nursing service personnel are encouraged to use.

At the state and regional level, nursing organizations have received approval for release time for inservice attendance and funding to cover costs of outside education as fringe benefits through collective bargaining.

2. Joint Commission on Accreditation for Hospitals

The Joint Commission places considerable emphasis on orientation and inservice training programs for registered nurses and requires hospitals to maintain nursing and administrative policy and procedure manuals as a basis for these programs. Its Standard V specifically states that the program for staff education and training must include orientation, inservice education, and provision for continuing education.

- Orientation programs must be planned in advance and include at least a written outline designed to ensure a thorough orientation for each new nursing employee.

- Inservice education programs must be planned, scheduled, documented, and held on a continuing basis.

- Nursing personnel should be encouraged to attend continuing education programs using educational opportunities outside the hospital and to share what they have learned with others.

3. Medicare

The standards for Medicare certification are not as specific as are those of the Joint Commission. However, certification procedures require documentation that new employees are being oriented to the hospital, to the nursing service, and to their jobs. Nursing staff meetings should include establishment and/or interpretation of nursing department policies and interpretation of administrative and medical staff policies as continuing inservice education.

4. Office of the Surgeon General

In 1963, the Surgeon General's Consultant Group on Nursing stated that rapid change in science and technology requires constant education

of nursing staff, as well as good orientation of new nurses, and that staff education is needed by all practitioners regardless of the completeness and excellence of their original training. Programs delineated were: inservice education, built upon the previous education of the nurse; on-the-job training for those who receive training during employment, and continuing education, which makes use of educational opportunities outside the employing institution or agency.

5. American Hospital Association

The American Hospital Association (AHA) supports the need for inservice education and orientation departments as part of nursing service and places responsibility for these activities with the directors of nursing service. Activities include an orientation program developed for various positions and categories according to the responsibility each involves, to acquaint the nurse with the hospital, the nursing service, and the specific position, and an inservice program for continuing education within the institution. In its statement, AHA defines the latter to include providing necessary on-the-job training, guidance, and supervision in the performance of the job and evaluating the individual employee's need for education in terms of performance, job satisfaction, and potential for growth.

B. NATURE AND TYPES OF PROGRAMS

Overall responsibility for on-the-job education of nurses usually rests with the hospital's nursing director, subject to budgetary approval of the programs. A variety of people may participate in developing and providing the training. On the nursing staff, these may include directors of nursing, inservice education coordinators, supervisors, head nurses, clinical nurse practitioners, and staff nurses; and there can also be input from advisory committees including representatives of other clinical areas, from personnel departments, from affiliations of faculty with schools of nursing, and from nursing audit committees.

The terminology applied to in-hospital education and the definitions used may vary from hospital to hospital. We find it useful to classify in-hospital education for nursing staff into four types of activity, for which the terms orientation, skill training, leadership and management development, and continuing education seem appropriate.

1. Orientation

Orientation to the place of work includes a tour of the hospital and information as to the purpose of the institution and the philosophy, organization, and standards by which it operates. Planned orientation to the nursing service department includes an explanation of objectives and standards and a description of the nursing department's organization, lines of authority, and administrative control, as well as relationships between nursing services and other departments. Planned induction into

a specific job includes an explanation of criteria for evaluation of individual performance, an explanation of how the unit is managed and the place of the new employee in the total unit, and an introduction to other personnel.

2. Skill Training

Orientation activities often include some training of new personnel in the skills involved in their duties. In addition, all employees need periodic review and skill transfer and refresher programs, either within the work setting or outside. Skill training is intended to meet the following objectives:

- Provide the hospital and patients with staff who are able to perform safely and efficiently.
- Enable the employee to meet standards established for efficiency and quality of performance.
- Shorten the required period of direct supervision.
- Promote job satisfaction for the individual.

3. Leadership and Management Development

Leadership and management development programs prepare staff to carry out a variety of management and/or supervisory responsibilities. Potentially capable leaders on the staff are not always free to obtain preparation elsewhere, and nursing departments can develop these people on the job, utilizing outside resources and facilities where available and when desirable. Leadership and management development programs are designed to:

- Develop appreciation of services and objectives of the hospital.
- Permit increased delegation of authority.
- Aid in reducing costly turnover in top positions.

4. Continuing Education

Continuing education programs in nursing stimulate review of, and add to, knowledge previously gained; promote voluntary investigation of new ways of providing nursing care; and provide continual opportunity for contributing to better patient care. Employees can thus see their own work in perspective and can keep up with developments in the health field.

5. Definitions Used in This Study

In this study, we have used the term in-hospital education to cover all four of the above activities, except insofar as they use educational resources outside the hospital. This is divided into orientation, defined as in (1) above, and inservice education, defined as including skill training (other than that provided during orientation), leadership and management development, and any portion of continuing education that is provided by the hospital itself.

C. EDUCATIONAL PREPARATION OF REGISTERED NURSES

1. Types of Programs

At present, the professional registered nurse (RN) is being educated in three types of program, all of which prepare the student to fill first-level nursing positions. Table 1 shows the changing proportion of RNs being educated in the three types of programs. Brief descriptions follow.

a. Hospital-Based Diploma Program

The traditional mode of educational preparation for the registered nurses has been the hospital-based diploma program. In the early 1940s, when RNs were in short supply, the number of these programs increased greatly under the Cadet Nurse Program. The diploma program is a three-year (now sometimes shorter) program in which the student is taught basic nursing skills and some basic physical and social sciences by nurse faculty members recruited and employed by the hospital school. The hospital's Director of Nurses in many instances holds overall responsibility for the school of nursing as well as for the delivery of nursing service in the institution. The schools have been supported in part by modest tuition fees, supplemented in the past by the service contribution of the students. The rationale for supporting a school of nursing was that the students would provide patient care at the hospital during the clinical experience portion of their program and later would constitute a pool of nurses who would generally remain on the staff of the hospital after graduation.

The Joint Commission on Accreditation has since disapproved the use of student nurses as staff and has indicated that this practice may jeopardize hospital accreditation, and the National League for Nursing has acted similarly with respect to diploma program accreditation. For this reason and because of a growing trend toward academic preparation of nurses (see below), the number of diploma programs has been decreasing. From 1962 to 1971 the number of programs that closed increased each year. Thus, the number of diploma graduates is steadily declining. Diploma graduates accounted for 41.7% of new RNs in 1972 and only 32% in 1974.[1]

---

[1] 1972 data from Facts About Nursing, 1972-73, American Nurses' Association, p. 78; 1974 from National League for Nursing, Publication No. 191568.

TABLE 1

GRADUATIONS FROM INITIAL PROGRAMS
OF NURSING EDUCATION FOR RNS
IN THE UNITED STATES AND OUTLYING AREAS

	Academic Year			
Nursing Program	1961-62	1966-67	1971-72	1973-74
Associate Degree	1,159	4,654	19,165	29,299
Percent of Total	*3.7*	*12.2*	*37.0*	*43.3*
Diploma	25,727	27,452	21,592	21,280
Percent of Total	*82.5*	*71.8*	*41.7*	*31.5*
BA/BS	4,300	6,131	11,027	17,049
Percent of Total	*13.8*	*16.0*	*21.3*	*25.2*
Total Graduations	31,186	38,237	51,784	67,628
	100.0	*100.0*	*100.0*	*100.0*

SOURCE: 1973-74 from NLN Publication No. 191568; remainder from Facts About Nursing, 1972-1973, ANA, p. 78.

b. Associate Degree Program

The AD program emerged in the late 1940s in response to a continuing need for more nurses, a belief that the period of clinical practice could be shortened if carefully planned and monitored, and a desire to include more academic content in the preparation of nurses. Usually two years in length, and provided in community and junior colleges or universities, the AD program is most often publicly supported. Included are basic courses in general education, some physical and social sciences, courses in nursing, and a selective and relatively short period of clinical practice. These programs educate the first-level or technical nurse to function as staff in the hospital setting. A growing proportion of RNs are being trained in AD programs: AD graduates accounted for 37% of new RNs in 1972 and 43% in 1974.[1]

c. Baccalaureate Program

The baccalaureate program includes broader and more in-depth courses in the physical and social sciences, languages, and mathematics, as well as nursing education. This is generally a four-year program with planned clinical experience in hospitals and other health care settings. The faculty represents other disciplines as well as nursing, and all faculty must meet university academic preparation requirements. These programs prepare nurses to practice first-level nursing skills as well as to plan, direct, supervise and teach others. It is to this group of nurses that many hospitals look for candidates for head nurse and other supervisory positions. The proportion of baccalaureate graduates is increasing, though more slowly than that of AD graduates. Baccalaureate graduates comprised 21.3% of new RNs in 1972 and 25% in 1974.[1]

2. Concerns About Quality of Preparation

As AD programs have gained in popularity, many diploma programs have responded by shortening their duration to a little over two years and by including academic courses obtained outside the hospital. Thus, there is a general trend toward shorter periods of clinical practice for all student nurses.

Both in interviews and in their comments on our survey questionnaire for this study, nursing directors have confirmed what has been our experience from past work--that many are uneasy about the clinical skills of new nurses. Despite the increasing similarity of programs, they have specifically indicated concern about AD graduates. Some told us they are reluctant to accept AD graduates because they believe additional orientation and clinical supervision is necessary to bring these nurses up to the level of the diploma graduates.

This type of concern is not limited to AD graduates. Some nursing directors have also questioned the appropriateness of the training

---

[1] Ibid.

received in baccalaureate programs as a preparation for clinical duties.

To help clarify this issue, it is of interest to know whether nurses from the different types of program do receive different amounts of supplemental education once they are on the job. Previous studies have attempted to evaluate the relative costs of the three types of program by identifying yearly costs of nursing education to the point of program completion.[1] However, the full costs of nursing education also include the education received after that time. This study provides estimates of the costs of nursing education from the point where the new nurse joins the hospital staff.

D. OBJECTIVES AND SCOPE OF THIS STUDY

The major objectives of this study were to provide answers to the following questions:

(1) How many hospitals (by type, location, and other characteristics) have identifiable inservice education and orientation programs?

(2) What do these programs cost?

(3) What is the source of funding of these programs?

(4) What is the total annual national cost of inservice education and orientation training?

(5) To what extent does the training vary for nurses by educational preparation?

(6) To what extent are hospitals limiting the provision of such training because of insufficient availability of funds? Of insufficient qualified training personnel?

The study covered nonfederal acute care hospitals. Results were obtained through a nationwide survey of hospitals and examination and statistical analysis of the responses.

Our findings, presented in this report, identify for the first time the general dimensions of the costs of in-hospital education. They provide insight into the kinds of relevant data which are not generally recorded by hospitals as well as those which are recorded. They are not the final word on costs; rather, they show what can be learned from the data now available and focus attention on the specific areas where further study is needed to ascertain costs more accurately.

---

[1] See, for example, a report by the Institute of Medicine, Costs of Education in the Health Professions, Washington, D.C. National Academy of Science, January, 1974.

II. METHODOLOGY

A. LITERATURE REVIEW

We conducted a literature search to identify materials relating to the definition of teaching activities in hospitals; the nature of programs currently offered; "activity studies" of the time it takes to carry out nursing functions, with particular attention to in-hospital teaching activities; and cost surveys in hospitals, again with special attention to teaching activities. Appendix A to this report includes a bibliography of publications reviewed, with annotations for selected items.

We found considerable evidence of concern about the readiness of newly graduated nurses to assume clinical responsibilities.[1] A study by the National Commission for the Study of Nursing and Nursing Education compared the performance of AD, diploma, and baccalaureate graduates on New York State professional nursing examinations and found that in general the baccalaureate graduates scored highest, the diploma graduates next, and the AD graduates third; however, there was great overlap among the three groups and a wide range of performance within each group.[2]

We also found interesting discussions of the purpose of in-hospital education for nurses and the nature and quality of present in-hospital education programs, and we found activity studies which included education. However, we found very few studies of costs in the literature and no studies which attempted to determine the costs of in-hospital nursing education on the basis of actual hours and salaries. Thus, our study does not duplicate previous work, and while we have drawn upon some of the literature in interpreting our study findings, we did not base our survey design or analytical approach on studies described in the literature.

B. QUESTIONNAIRE SURVEY

Figure 1 summarizes the process of designing and conducting our questionnaire survey, through the point at which the data obtained were coded and keypunched for the computer. The content and method of the survey are discussed below. Section C describes our approach to analyzing the results.

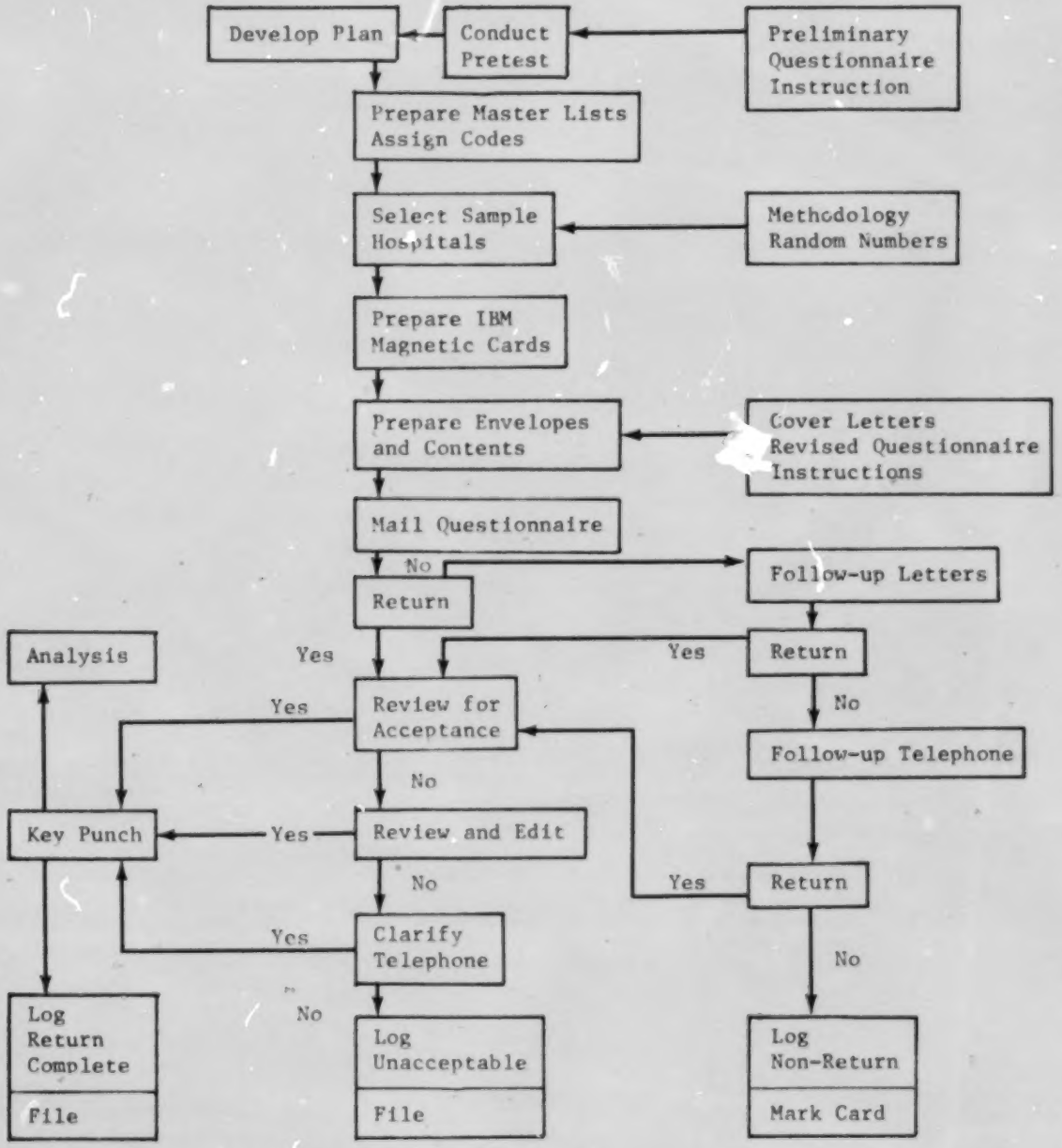
---

[1] See, for example, the annotations in Section 3 of Appendix A for J. Crancer et al., "Clinical Practicum Before Graduation," Nursing Outlook, February 1975; J.S. Murphy, "The Dilemma of Nursing Practice," Journal of Nursing Administrations, January-February 1974; and M.A. Paduano, "Evaluation in the Nursing Laboratory: An Honest Appraisal," Nursing Outlook, November 1974.

[2] National Commission for the Study of Nursing and Nursing Education, An Abstract for Action, McGraw-Hill, 1970. See annotations in Section 3 of Appendix A.

FIGURE 1

THE SURVEY PROCESS



1. The Survey Sample and Final Data Base

The population we studied consisted of 5,865 "community" hospitals identified in the Hospital Guide Issue Of The Journal Of The American Hospital Association published in October 1973. Community hospitals were defined as nonfederal, short-term, and general acute care hospitals. Excluded from this population were federal hospitals and psychiatric, tuberculosis, and other long-term care hospitals.

The hospital population was stratified for sampling by census region and number of hospital beds, as reported in the Hospital Guide Issue of 1973. Tables 2 and 3 show the number of hospitals and beds in each of the six hospital bed size groups and nine regions used in the stratification. The resulting 54-cell matrix was sampled in proportion to the number of hospital beds in each cell--that is, in each size group by region. The number of beds was used instead of the number of hospitals to make our projections more accurate: the number of nurses receiving in-hospital education is more nearly proportional to the actual number of beds than to the number of hospitals in a size bracket or any other available statistic.

This procedure resulted in a stratified random sample of 998 hospitals. (Originally, there were 1,000 hospitals, but two questionnaires were returned as undeliverable.) The study questionnaire was mailed to these hospitals, and 394 usable responses were received, representing 40% of the sample and 7% of the actual hospital population. As Table 4 shows, the response rate varied considerably among individual region and size class combinations but was consistently high for the largest hospitals across all regions.

Our initial cost calculations for the 54-cell matrix, our national cost projections, and the multiple regression analysis used to determine the influence of different variables on costs (all discussed in Section C of this chapter) were based on data from 345 of the hospitals. Forty-nine responses that arrrived later were included when we made the compilations and breakdowns of sample data presented in Sections C and E of the next chapter.

Data on 83 additional hospitals were obtained in a follow-up survey of nonrespondents, but these responses were not incorporated in our cost estimates. As discussed later, they were used to test for bias in the estimates due to nonresponse.

2. Questionnaire Content and Instructions

The survey questionnaire (reprinted in Appendix B) was designed to elicit the following information:

- Year for which data are reported; number of patient days in that year; number of new RNs hired in that year, by basic preparation (AD, diploma, BA/BS) and job experience; total RNs on the staff at year's end, by job level; average RN salaries by basic preparation, experience, and job level.

TABLE 2

HOSPITAL POPULATION STUDIED: STRATIFICATION BY SIZE GROUP

Size Group (Number of Beds)	Number of Hospitals	Number of Beds	Percent of Total Beds
Under 100	3,183	150,200	17.3
100-199	1,270	176,400	20.3
200-299	607	146,500	16.9
300-399	360	122,900	14.2
400-499	198	96,800	11.2
500 and Over	247	174,100	20.1
Total	5,865	866,900	100.0

TABLE 3

HOSPITAL POPULATION STUDIED: STRATIFICATION BY CENSUS REGION

Region[1]	Hospitals	Number of Beds	Percent of Total Beds	Percent of Hospitals Included In Original Sample
I. New England	290	49,191	5.7	19.7
II. Middle Atlantic	690	163,580	18.9	34.3
III. South Atlantic	762	120,645	13.9	20.7
IV. East North Central	916	173,309	20.0	21.8
V. East South Central	462	54,802	6.3	13.6
VI. West North Central	798	89,726	10.4	13.0
VII. West South Central	827	82,042	9.5	11.5
VIII. Mountain	357	34,181	3.9	10.9
IX. Pacific	763	99,053	11.4	14.9
	5,865	866,519	100.0	17.1

[1] States in each region are as follows:

I. Connecticut
Maine
Massachusetts
New Hampshire
Rhode Island
Vermont

II. New Jersey
New York
Pennsylvania

III. Delaware
District of Columbia
Florida
Georgia
Maryland
North Carolina
South Carolina
Virginia
West Virginia

IV. Illinois
Indiana
Michigan
Ohio
Wisconsin

V. Alabama
Kentucky
Mississippi
Tennessee

VI. Iowa
Kansas
Minnesota
Missouri
Nebraska
North Dakota
South Dakota

VII. Arkansas
Louisiana
Oklahoma
Texas

VIII. Arizona
Colorado
Idaho
Montana
Nevada
New Mexico
Utah
Wyoming

IX. Alaska
California
Hawaii
Oregon
Washington

TABLE 4

QUESTIONNAIRES MAILED, USABLE RESPONSES, AND USABLE RESPONSES AS PERCENT OF MAILING

Region		Under 100 Beds	100-199	200-299	300-399	400-499	500 and Over	ALL SIZES
I	Mailed	9	12	13	10	5	8	57
	Used	3	5	9	7	2	4	34
	% of Mailing	33	42	13	70	40	50	60
II	Mailed	11	32	41	32	17	56	189
	Used	2	9	15	15	7	32	80
	% of Mailing	18	28	37	47	41	57	42
III	Mailed	23	31	19	22	16	26	137
	Used	3	9	10	11	9	12	54
	% of Mailing	13	29	53	50	56	46	34
IV	Mailed	24	41	37	30	21	47	200
	Used	6	8	12	11	12	27	76
	% of Mailing	25	19	32	37	57	57	38
V	Mailed	18	15	9	5	8	8	63
	Used	4	4	2	2	3	3	18
	% of Mailing	22	27	22	40	38	33	29
VI	Mailed	29	21	12	15	9	18	104
	Used	8	6	6	8	9	10	47
	% of Mailing	28	29	50	53	100	55	45
VII	Mailed	30	24	10	8	5	18	95
	Used	4	8	2	4	1	10	29
	% of Mailing	13	33	20	50	20	55	31
VIII	Mailed	11	8	7	5	4	4	39
	Used	4	5	4	2	1	3	19
	% of Mailing	36	63	57	40	25	75	49
IX	Mailed	30	29	16	17	10	12	114
	Used	6	11	6	8	6	4	41
	% of Mailing	20	38	38	47	60	33	36
ALL REGIONS	Mailed	185	213	164	144	95	197	998
	Used	40	65	66	68	50	105	394
	% of Mailing	21	30	40	47	52	53	39

- Whether the hospital has identifiable orientation and inservice programs.

- Costs of orientation, including (1) orientee salary costs by basic preparation and job experience and (2) training staff salary costs.

- Whether orientation periods are adjusted according to the basic preparation of new nurses.

- Costs of inservice education, including salaries of trainees and training staff.

- Whether there are enough qualified staff to perform training functions.

- Cost information for the department of inservice education if available from the hospital's accounting system, including direct salaries and expenses, and indirect allocated costs.

- Cost information for the nursing service, excluding nursing education.

- Sources of hospital revenue.

- Comments regarding in-hospital education and the survey questionnaire.

We confined the survey questions to basic information having a direct bearing on the costs of orientation and inservice training. For example, we did not ask questions about turnover rates of nurses or the staffing practices in patient care areas. Our intention was to produce as simple a questionnaire as possible and yet acquire sufficient data for our study to provide reliable answers.

Definitions and instructions were prepared for all of the questions and included in the questionnaire booklet. Examples of the definitions are as follows:

RNs: Registered nurses licensed to practice in state. They may also be hired in an RN position while awaiting State Board Examination results. Foreign graduates may not be included unless licensed.

AD: RNs prepared in a two-year academic program granting an Associate Degree in Nursing.

Diploma: RNs prepared in a two to three year program in a hospital school of nursing. No academic degree granted. Include foreign educated RNs in this category if educated in a hospital school.

BA/BS: RNs prepared in a four to five year academic program granting a Baccalaureate Arts/Science Degree in Nursing and/or an RN prepared in a diploma program and subsequently granted a Baccalaureate Degree from an academic program.

Other: All other preparation such as Master of Arts/Science, Post-Baccalaureate preparation, Ph.D., etc.

RNs with no experience: An RN who has completed a preparation program, but has not practiced nursing. May be hired in an RN position awaiting State Board Examination results.

RNs with recent experience: An RN who has been active (practicing) in nursing and has recent nursing practice experience.

Returning RN: An RN who has been inactive (not practiced) in nursing for a number of years and is not considered experienced.

For some questions, if a hospital did not have records of the information requested--for example, if hours of clinical orientation were not recorded--the respondent was asked to supply estimates and to so indicate on the questionnaire.

3. The Pretest

The study design included a pretest in nine hospitals in Massachusetts, followed by interviews with the directors of nurses in those hospitals to verify that data reported on the questionnaire agreed with that obtained in the interview. An additional portion of the interview was devoted to a critique of the questionnaire and of the enclosures, and comments were used as a basis for modifying format.

As a result of the pretest, we revised the questionnaire before mailing it to the study sample. Most of the changes were made to improve clarity. The one major change was removal of a question concerning the numbers of AD, diploma, and BA/BS graduates in inservice education. The hospitals recorded the basic preparation of nurses participating in orientation programs, but most did not record this information for nurses receiving subsequent in-hospital education. The revised questionnaire therefore requested this breakdown only for orientation.

4. Conduct of the Survey

The revised questionnaire was then distributed to the sample hospitals. Respondents were invited to correspond with us by mail or telephone in order to clarify questions or to obtain other information concerning the project. Two follow-up letters were sent to each non-respondent at monthly intervals, and many nonrespondents were further contacted by telephone. Considerable telephone contact was necessary in some cases to persuade nursing departments to supply estimates where records were unavailable.

As the questionnaires were received, they were carefully edited by a panel of nurses and a statistician to check for logical consistency and reasonableness of responses. Contradictory responses were eliminated and data considerably outside the norm were checked by telephone. This process produced a more reliable data base and also gave project staff a familiarity with the responses which proved valuable in interpretation of the data.

We thought at first that facilities were reporting much too long a time for clinical orientation. Early in the editing procedure, a number of facilities were requestioned, and the great majority (75-80%) answered that they intended the number of hours reported. (Since we did not specify "contact" versus "close supervision" hours in the questionnaire, the hospitals were able to report all hours which they felt were essentially "lost" to patient care because of orientation needs, rather than trying to adhere to definitions of these terms.) Thereafter, only the more obvious deviations, such as reporting of total annual hours instead of hours per RN (this was done by several) required verification of reported figures.

5. Nature of the Responses

About half the responding hospitals reported data for the year 1974. The rest reported for 1973.

As shown in Table 4 earlier, response rates were highest for the largest hospital size groups. Also, a greater proportion of large hospitals than of small ones received questionnaires since a given number of beds represents fewer hospitals in the large size groups and the sampling was done by number of beds. Thus, for the largest size groups, we obtained data from a significant proportion not only of the sample population but also of the total number of hospitals in each group: 50 out of 198 identified hospitals in the size group 400-499 beds and 105 out of 247 in the size group 500 beds and over.

Despite the pretest, a few questions proved to be unanswerable by a majority of respondents. The answers to these were not used for statistical analysis, although in some cases they are discussed separately in the next chapter. One of these concerned the participation of non-nursing staff in preparing and conducting orientation and inservice programs. Many places reported hours (Questions 9 and 16) for participation of these other staff, but without salary costs (Question 10), making computation impossible. Thus, the training staff component of our cost estimates includes nursing staff only and can be assumed to understate actual hours and costs somewhat (though by less than 5%).

For nursing staff who participate in training, staff hours by job category (again Questions 9 and 16) were frequently reported as estimates. We used this information, together with salary data reported as taken from records, in calculating average costs for all training staff by region and hospital size group, and we believe that these aggregate figures are fairly accurate; however, we have not reported the job category breakdowns since they are not precise enough to be meaningful.

A group of other questions elicited too few responses to be usable. They were intended to place in-hospital education costs in the context of total nursing service costs. Many hospitals could not report the total salary costs for nursing service other than education (Question 21) or for nursing administration other than education (Question 22) because their cost reporting methods did not conform to the AHA Chart of Accounts classification used in formulating the questions. Also, most hospitals having identifiable inservice education departments were able to report only direct salary costs for these departments, not costs of supplies or indirect costs (Questions 25 and 26).

Finally, a difficulty was introduced by the fact that in reporting total numbers of RNs (Question 12), some hospitals reported actual numbers on the payroll as requested, while others reported full-time equivalents. This inconsistency prevented the calculation of relationships between staffing and numbers of beds in order to show inservice training hours as a percent of total staff hours. Our calculations of orientation costs were not affected, since numbers of new hires were reported quite consistently as having been taken from records.

6. Degree of Estimation in Responses

The eight questionnaire items for which respondents were asked to indicate whether they had used estimates concerned numbers of nurses, salaries, and hours for orientation and inservice efforts. Respondents were asked whether their figures were taken entirely from records, partly taken from records and partly estimated, or entirely estimated. There were no questions for which all of the data had to be estimated by all of the hospitals. As would be expected, "hard" data predominated in the case of the number of new nurses hired, the educational preparation or experience of the new nurses, and the salaries for new nurses, as follows:

	Records	Mixed	Estimates
Number hired	87%	13%	-
Preparation/experience	71%	26%	3%
Salaries	60%	36%	4%

Considerably fewer of the respondents could supply data from records either for clinical unit orientation hours or for staff hours devoted to orientation and inservice education, as shown below:

	Records	Mixed	Estimates
Clinical unit orientation hours	17%	70%	13%
Orientation staff hours	4%	76%	20%
Inservice staff hours	6%	65%	29%

However, it is encouraging that 17% of the hospitals did have complete records for clinical unit orientation and that the majority had at least some recorded data on both these and training staff hours.

Forty-three percent of the salary information for training staff was taken from records and 49% from combined records and estimates.

We were somewhat surprised to find that only 40% of the respondents could report the total number of RNs in the hospital by job category entirely from records, while 57% used mixed records and estimates and 3% used estimates only. Some facilities indicated that the total number was from records but the mix of job categories (staff nurse, head nurse, etc.) was estimated.

C. ANALYSIS OF THE DATA

The survey data were processed (1) to calculate the costs of orientation and inservice education for each sample hospital, (2) to project these to the entire relevant population of hospitals, (3) to determine by regression analysis the relative importance of individual variables contributing to these costs, and (4) to produce a set of cross-tabulations reporting basic data on the hospitals and various breakdowns of the cost results for each cell of the region--size group matrix. The first three sets of operations used data from 345 hospitals; the fourth used all 394 responses (49 were received after the first calculations had been done). A fifth step in the analysis, a test for bias of nonresponse used data from 83 hospitals which had not responded to the original survey. These operations are summarized below; Appendix C describes the statistical methodology in detail.

1. Calculation of Costs

Annual orientation costs, inservice education costs, and combined costs were calculated for each hospital. The procedure is detailed in Section 1 of Appendix C and summarized here. Orientation costs were calculated as follows:

(1) Orientee salary costs were computed for each basic preparation and experience category (AD, diploma, BA/BS, other inexperienced, recent experience, returning) by multiplying the number of newly hired nurses and average hourly salary in each category by the total hours of formal (assumed to be constant for all categories) and clinical unit orientation. A weighted total cost per hospital was computed summing all categories.

(2) Training staff costs were computed by multiplying orientation hours per month attributable to each job category by the average hourly salary in each category. A weighted total cost across categories was obtained and multiplied by 12 to produce annual cost per hospital.

(3) The two annual total costs were added to obtain total orientation costs for the hospital.

Inservice education costs were computed as follows:

(1) Trainee salary costs were obtained by calculating the weighted average hourly salary over all types of RNs who normally participate in inservice training and multiplying this salary by the total hours spent by all RNs in inservice training (number presentations x duration x reported number of nurses attending). (It was assumed that the mix of nurses for inservice attendance is proportional to the total RN population by job, i.e., staff nurse, head nurse, etc.)

(2) Trainer salary costs were calculated in the same way as for orientation.

(3) Again, the total annual cost is the sum of the two numbers.

2. Projection to Total Hospital Population

Using the results for individual hospitals, we calculated an average or mean sample cost for orientation, inservice education, and orientation plus inservice for each of the 54 cells in the size-by-region matrix. We also calculated the variances and standard deviations associated with each mean. The means and standard deviations are presented in Section 2 of Appendix C. We projected costs from these sample means to the total "universe" of 5,865 community hospitals by (1) multiplying the mean cost for each cell of the matrix by the total number of hospitals in that cell as determined in our stratification of the hospital population and (2) adding the totals for the 54 cells. We constructed 95% confidence intervals for the resulting total cost estimates[1] and computed coefficients of variation for each estimate. In addition, we calculated the mean per-hospital cost of orientation, inservice, and orientation plus inservice over all size groups and regions, with the variances, standard deviations, and

---

[1] A confidence interval must be carefully interpreted. A 95% confidence interval means that in 95 samples out of 100 of the true total cost would lie within the interval specified. Put another way, the method used to obtain the interval is 95% reliable. The narrower the interval, the more confident one can be of the cost estimates. The interval is dependent on sample size; the larger the sample, the smaller the estimated interval.

coefficients of variation of these costs. Section 3 of Appendix C describes the methodology and results.

3. Multiple Regression Analysis

Multiple regression analysis is a standard statistical technique for quantifying the effects of certain predictor, or independent variables, singly or in combination, on a dependent variable. The process shows whether a specific predictor variable is a significant contributor to variability in the dependent variable, gives the percent of variability "explained" by the regression equation, and provides an error range for values of the dependent variable predicted by the equation.

Initially, we performed a regression analysis using as the dependent variables total orientation cost, total inservice education cost, and total combined cost per hospital. We found that effects due to hospital size masked possible effects due to other variables. To eliminate the size effects, subsequent analysis was done using (1) orientation cost per patient day, (2) inservice education cost per patient day, and (3) combined cost per patient day as the dependent variables. Section 5 of Appendix C describes our methodology and shows the regression equations and the "goodness of fit" (r^2 values) of the results.

4. Cross-Tabulations

Using the Crosstabs II tabulation program, a very flexible computer program that has been used in a number of previous studies, we programmed the computer to select any combination of data in any requested sequence, perform any desired computation repeatedly for all 54 matrix cells, and display the results in a table or series of tables. The following Crosstabs tables appear in Appendix D and were the basis for most of the tables and graphs in this report:

Crosstabs Table Number	
1	Average Number of RNs Hired per Sample Hospital in Year Reported, by Hospital Size Group and Category of RN
2	Average Length of Orientation Program in Hours per RN, by Hospital Size Group, Type of Orientation, and Category of RN
3	Average Hourly Salary and Total Salary Cost per Newly Hired RN for Orientation, by Hospital Size Group and Category of RN
4	Average Annual Staff Hours per Sample Hospital for Orientation, by Size Group and Region
5	Average Hourly Salary of Training Staff for Orientation, by Size Group and Region

Crosstabs Table Number	
6	Average Annual Salary Costs per Sample Hospital for Orientation of Newly Hired RNs, by Size Group and Region
7	Data on Inservice Presentations, by Size Group and Region
8	Average Hourly Salary of Participants and Training Staff for Inservice Programs, by Size Group and Region
9	Average Annual Salary Costs per Sample Hospital for Participants and Training Staff in Inservice Programs, by Size Group and Region
10	Annual Costs per Sample Hospital for Orientation and Inservice Education, by Size Group and Region: Average Total Cost, Average Cost per Episode of Illness, and Average Cost per Patient Day
11	Percent of Respondents Having Orientation and Inservice Programs, by Size Group and Region
12	Time Needed to Find New Inservice Program Director, All Hospitals
13	Percent of Hospitals in Sample Having Diploma Schools, by Size Group
14	Average Percent Source of Revenue per Sample Hospital, by Size Group

5. Test for Bias Due to Nonresponse

We performed a follow-up survey in order to test for a bias in the total national cost estimates caused by differences between responding and nonresponding hospitals. Data were obtained from 83 hospitals that had failed to respond either to the original survey or to our follow-up letters. Mean costs and variances for this smaller sample in each cell of the size-by-region matrix were calculated using the same methodology as described above for the original sample of 345 hospitals. Total national costs for orientation, inservice training, and combined costs were then estimated, as well as the 95% confidence limits for the estimates, variances, standard deviations, and coefficients of variation. These cost estimates were compared to the estimates based on data from the original sample.

A number of the original respondents had indicated to us that they found the questionnaire too detailed. To facilitate participation in the follow-up survey, we therefore condensed the questionnaire to four pages. We also indicated where to find answers to some of the questions, such as the hospital copy of reports submitted to the Joint Commission, personnel records, etc. We then telephoned nonresponding facilities in each size group in each region, and in most "cells" we were able to find three facilities which indicated willingness to respond on the condensed questionnaire.

This group of "nonresponders" received the questionnaire together with the appropriate cover letters, assurances of confidentiality, and an invitation to call for assistance. With the intensive preparation and assurances of willingness to participate, the response rate was approximately 60%.

The survey results are discussed in the context of our original cost estimates in Section B of the next chapter. Details appear in Section 4 of Appendix C.

D. EVALUATION OF THE METHODOLOGY

We were asked to evaluate the methodology used in this study, particularly as to whether the approach used--a retrospective study using mailed questionnaires--produced useful and reliable material, given the variations and gaps in hospital record-keeping practices. We found, in general, that it did. Although hospitals did have difficulty in answering some questions, the data they supplied produced quite reliable overall cost estimates.

1. Overall Accuracy of Results

a. Use of Estimates

The main problem for the study was that the data required were in many cases not normally kept by hospital nursing and accounting departments and that nursing departments were reluctant to provide estimates. It was very apparent during the pretest interviews that the nurses disliked estimating numbers and activities. They were very willing to convey general impressions, but to obtain quantitative information we had to be persistent and provide some guidance. The experience of our telephone follow-up was similar. Once faced with the necessity of estimating, however, nursing staff wanted to be accurate and their responses were generally carefully thought out. We compared estimated and recorded responses regarding clinical unit orientation and found a close correspondence, suggesting that the estimates are probably as reliable as the information taken from records.

b. Weighting of Sample

The weighting of our survey sample toward larger hospitals due to the use of number of beds as the sampling criterion appears to be entirely appropriate. The subject of concern is the in-hospital education of nurses, not the individual departments which provide this education. Also since a significantly larger proportion of inexperienced nurses (hospital definition) are hired in large hospitals than in small ones, we can be particularly confident concerning our measurements of the effort and expense involved in bringing new nurses with differing types of preparation up to the desired performance level in the hospital.

c. Inflation of Numbers of New Nurses

We suspect that the numbers of inexperienced nurses reported by hospitals in the survey are inflated by a tendency of hospitals to classify as "inexperienced" any nurse at the bottom of the salary scale or any newly hired nurse who has not had a year or more of experience elsewhere, despite the definitions provided in the questionnaire. (This view is supported by our experience with hospital personnel departments and also by the statement of several survey respondents that they provide the same clinical orientation to all nurses regardless of experience.) Since there is a fairly large turnover among nurses in their first year of employment, the effect could be significant double counting of numbers of new nurses. This does not, of course, bias our cost estimates, since the orientation provided is based on the hospital's definition of experience; however, it does prevent us from testing our results by comparing a projection of numbers of newly hired inexperienced nurses to existing statistics on numbers of newly graduated nurses. The problem could have been avoided if we had emphasized that respondents should report the number of newly hired nurses in their first job.

d. Test for Nonresponse Bias

Since the estimates from our follow-up survey to test for bias due to nonresponse are of interest primarily in comparison with our original cost projections, they are discussed in the next chapter (Section B) after we present the projections. To summarize, the two sets of estimates are nearly compatible if one allows for inflation, indicating that any bias due to nonresponse is very small.

e. Conservativeness of Estimates

Our cost estimates can be assumed to be conservative in three respects. First, as already noted, they cover direct salary costs only. If the hospitals had been able to provide indirect costs and costs for supplies, we would have a more comprehensive picture of true costs.

Second, a large portion of both clinical unit orientation and inservice education consists of activities that are too unstructured to measure. Several survey respondents emphasized that their programs are flexible and geared to the individual nurse. Once an RN is assigned to a clinical unit, varying amounts of one-to-one supervision and training are provided. If all such activity could be quantified, its costs would undoubtedly raise our cost estimates, though considerable thought would need to be given to defining where education leaves off and supervision begins.

Third, the training staff component of costs does not include the contribution of non-nursing staff to orientation and inservice education.

It should also be kept in mind that the cost estimates are for in-hospital education of RNs only and are for a year representing 1973 and 1974 data. Some respondents expressed frustration at not being allowed to report their extensive training activities for LPNs and aides, and the effects of inflation on costs have been noted above.

2. Design and Conduct of the Survey

Section B of this chapter has noted the survey questions that could not be answered or were not properly answered by responding hospitals. In one case--the composition of RNs in inservice education by type of basic preparation--the impossibility of providing the data became evident in the pretest and the item was dropped from the questionnaire.

In another case, results of the pretest were misleading. To minimize study costs, the pretest was conducted within a single region (New England), and this group of hospitals was able to answer the questions regarding nursing service and nursing administration costs based on the AHA Chart of Accounts. When the questionnaire was distributed to the entire sample, however, relatively few hospitals could provide this information. A geographically representative pretest would have been more expensive but might have alerted us to the problem. We would then probably have planned to rely on AHA published data for 1973 for this information and to specify 1973 as the reporting year in the survey. This set of questions (salary costs) caused additional problems because the wording of the original questionnaire was ambiguous. To get even the limited number of responses we obtained required mailing of a corrected question to all respondents and considerable telephoning.

The reporting of full-time equivalents instead of actual numbers of RNs by some respondents could have been averted by providing separate columns in the questionnaire for listing full-time and part-time nurses. As noted earlier, lack of consistent information on the numbers of RNs precluded a determination of inservice hours and costs per staff RN.

A common approach to filling out questionnaires is to attempt answers without reading instructions. (This may be an inherent failing in any questionnaire which is long enough to require instructions.) Some of the extensive follow-up effort required might have been avoided if non-recorded information had been obtained via telephone and only items which are readily found in records requested on the questionnaires. Some follow-up mailing could have been eliminated had we immediately contacted the facilities by telephone. In telephone conversations there was little equivocation as to willingness to participate in the project; and telephone contacts were often necessary anyway to help respondents make estimates.

3. Prospective Versus Retrospective Data Collection

A prospective data collection project with a group of cooperating hospitals could have obtained answers to the questions that gave us difficulty: basic preparation of nurses in inservice education, costs of non-nurse training staff and of each category of trainer, extent of informal clinical unit orientation; orientation and inservice costs relative to total nursing service and nursing administration costs; and non-salary expenses and indirect costs. We do not expect that such a study would change our overall cost estimates markedly, but it would permit more precise cost breakdowns in some areas. Several respondents expressed an interest in participating in such an effort as a means of developing improved cost reporting methods for their own use. (Some also indicated that the survey questionnaire was helpful to them in this respect.) Such a project could be much smaller in scope than our study; its product would be a refinement of our cost data and a record-keeping and cost reporting system that could be adopted by both study participants and other hospitals to maintain the information on a continuing basis.

III. FINDINGS

A. ORIENTATION, INSERVICE EDUCATION, AND COMBINED COSTS PROJECTED TO ALL HOSPITALS

As described in the preceding chapter, we obtained estimates of the costs of in-hospital education for the total population of 5,865 hospitals by projection, using means and variances calculated for the sample population in each cell of our 54-cell region/size group matrix. Tables in Section 2 of Appendix C show the means and standard deviations.

The resulting estimated total annual direct salary cost of in-hospital education (orientation plus inservice) of registered nurses in the 5,865 acute care community hospitals in the United States, for the time period covered by our questionnaire responses (1973 for about half the hospitals and 1974 for the rest), is $226 million. As shown in Figure 2 and Table 5, it is estimated that approximately 60%, or $135 million, of this total was spent on orientation and 40%, or $91 million, on inservice education. Table 5 also shows estimated mean costs per hospital across all size groups and regions: $23,000 annually for orientation and $15,000 for inservice education, for a total of $38,000.

Our statistical analysis suggests that these figures are good estimates of the true costs. The sample size of 345 hospitals proved sufficiently large to obtain a relatively narrow cost interval estimate associated with a high degree of confidence, that is, 95% confidence. The lower and upper bounds of the 95% confidence intervals for the estimates are $206 million and $246 million for all in-hospital education, $122 million and $148 million for orientation, and $88 million and $94 million for inservice education.

It is interesting to note from Table 5 that the coefficient of variation for the estimated total and mean inservice education costs is less than half that for orientation. This shows that as a proportion of the estimated cost, the variation within the data was less for inservice than for orientation, indicating that inservice data were more uniformly reported from hospital to hospital.

Section 3 of Appendix C presents estimated total and mean costs by hospital size group (all regions) and by region (all size groups) for orientation, inservice, and orientation and inservice combined, together with the associated standard deviations and coefficients of variation. Again, the coefficients of variation are less for inservice education than for orientation. Estimated total orientation costs by size group have coefficients of variation ranging from 20% to 6%, whereas estimated total inservice costs by size group have coefficients of variation ranging from 8% to 1%. Estimated totals by region have coefficients of variation of 26% to 7% for orientation and 10% to 2% for inservice.

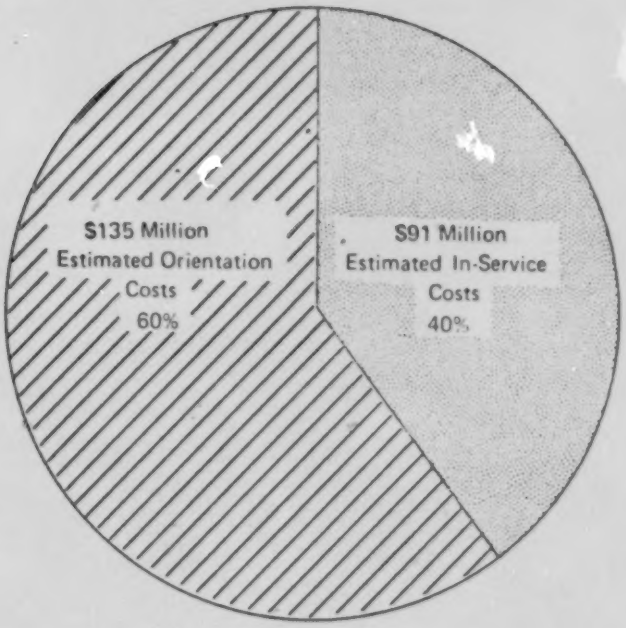


FIGURE 2 TOTAL ESTIMATED COSTS FOR ORIENTATION AND INSERVICE COMBINED: 226 MILLION DOLLARS

TABLE 5

ESTIMATED TOTAL AND MEAN COSTS
FOR ORIENTATION AND INSERVICE EDUCATION
(projections based on data from 345 hospitals)

Total Cost Estimates

($ millions)

	Orientation	Inservice	Orientation and Inservice Combined
Estimated Total Cost	$135	$91	$226
Standard Deviation	6.5	1.3	10
Coefficient of Variation	5%	2%	4%

Mean Cost Estimates

($ thousands)

	Orientation	Inservice	Orientation and Inservice Combined
Estimated Mean Cost	$23	$15	$38
Standard Deviation	1.2	0.24	1.8
Coefficient of Variation[1]	5%	2%	5%

[1] Coefficient of Variation = $\frac{\text{Standard Deviation of Estimate}}{\text{Estimated Value}} \times 100$

The coefficients of variation are generally smaller in the larger hospital size groups. This reflects the higher response rate from larger hospitals.

It should be noted that these are direct salary costs only. The actual cost of in-hospital education also includes that portion of fringe benefits accompanying the salaries paid to personnel while receiving (or providing) the orientation and/or inservice education. Respondents were not asked about fringe benefits, and as previously mentioned, their reporting of other indirect costs was inconsistent, and the data were not used.

The dollar value of all fringe benefits (non-payroll items such as employer contributions to Social Security, hospitalization insurance, etc.) varies from hospital to hospital, but is probably at least ten percent of payroll salary costs. Other factors in the cost of in-hospital education are overhead, equipment, and supplies used, none of which are included in our estimates.

B. COST PROJECTIONS FROM BIAS SAMPLE

As described in the previous chapter (Section C-5), we conducted a follow-up survey of 83 hospitals that had not responded to the original survey, in order to test for bias in our estimates due to nonresponse. Mean costs and standard deviations calculated for these 83 hospitals appear in Section 4 of Appendix C. Costs projected from these sample means to the total population of 5,865 hospitals come to $158 million for orientation, $105 million for inservice education, and $263 million for combined orientation and inservice education.

Table 6 compares these cost estimates with those made from the original sample. The table includes the 95% confidence limits, variances, standard deviations, and coefficients of variation for both sets of cost estimates.

TABLE 6

COMPARISON OF RESULTS FROM ORIGINAL SAMPLE AND FOLLOW-UP SAMPLE TO TEST FOR BIAS OF NONRESPONSE

	Results from Follow-Up Sample (83 Hospitals)	Percent Increase	Results from Original Sample (345 Hospitals)
Orientation:			
Total Cost, 5,865 Hospitals (C_o)	$158 million	15	$135 million
95% Confidence Interval	$154-162 million		$121-149 million
Variance C_o	$3 million x 10^6		$42 million x 10^6
Standard Deviation C_o	$1.8 million		$6.5 million
Coefficient of Variation	1%		5%
Inservice Education:			
Total Cost, 5,865 Hospitals (C_I)	$105 million	17	$91 million
95% Confidence Interval	$101-109 million		$88-94 million
Variance C_I	$2 million x 10^6		$1.7 million x 10^6
Standard Deviation C_I	$1.5 million		$1.3 million
Coefficient of Variation	1%		2%
Total Orientation and Inservice Education:			
Total Cost, 5,865 Hospitals (C_T)	$263 million	16	$226 million
95% Confidence Interval	$259-267 million		$206-246 million
Variance C_T	$3.7 million x 10^6		$100 million x 10^6
Standard Deviation C_T	$1.9 million		$10 million
Coefficient of Variation	1%		4%

The 95% confidence intervals associated with these cost estimates do not overlap, suggesting the possibility of sample bias. However, inspection of the data reveals that consistently higher salaries were reported in the second sample, which was surveyed nearly one year after the first. (The number of newly hired nurses and the number of hours spent in orientation and inservice education were consistent with the original sample.) Average hourly salaries of newly hired RNs, for example, are compared below for the two samples:

	Bias Sample	Original Sample
AD	$4.44	$4.19
Diploma	4.39	4.16
BA/BS	4.46	4.26
Recent Experience	4.62	4.47
Returning	4.51	4.30

The difference in average salaries is about 9.5%. If one increases the 95% confidence intervals for our original estimates by 9.5%, they do overlap those of the follow-up estimates, as shown below:

	95% Confidence, Bias Estimates	95% Confidence, Original Estimates, x 9.5%
Orientation	$154-162 million	$132-163 million
Inservice	$101-109 million	$ 96-102 million
Total	$259-267 million	$225-269 million

Since there is a 15-17% difference between the original and bias estimates (see Table 6), a small difference remains after salary increases are accounted for. It is not possible to be certain whether some of this represents a downward bias in the original estimates. The fact that a revised questionnaire was used and the lapse of a year could also have affected the results. If there is some bias in the estimates, however, it is very small.

C. DETAILED COST FINDINGS, STUDY SAMPLE

Table 7 summarizes our principal findings concerning in-hospital education costs and their components by hospital size group. The population represented consists of all 394 hospitals that returned usable survey responses, and the numbers were obtained using the Crosstabs Program. (See Crosstabs Tables 3, 6, 7, 9, and 10 in Appendix D.)

TABLE 7

SUMMARY OF SAMPLE DATA AND COST ESTIMATES
(Crosstabs, 394 hospitals)

	Hospital Size Group					
	Under 100 Beds	100-199	200-299	300-399	400-499	500 and Over
COMBINED COSTS OF ORIENTATION AND INSERVICE						
Annual Average Cost Per Hospital	$11,034	$43,282	$66,666	$85,729	$114,990	$210,412
Average Cost Per Patient Day	$ 1.049	$ 1.026	$ .923	$ .818	$ .874	$ .949
Average Cost Per Episode of Illness	$ 7.94	$ 7.14	$ 6.94	$ 6.47	$ 7.18	$ 9.40
ORIENTATION						
Average Salary Cost Per New Nurse	$279	$499	$550	$610	$636	$730
- AD Graduate	494	735	716	817	968	906
- Diploma Graduate	316	468	668	647	650	739
- BA/BS	314	706	659	671	863	857
- Experienced RN	198	402	418	471	469	570
Annual Salary Cost Per Hospital for Training Staff	$3,739	$11,358	$12,827	$15,594	$15,061	$33,746
Annual Salary Cost Per Hospital for All Orientees	2,501	15,033	28,189	38,743	52,149	97,132
Total Annual Salary Cost Per Hospital	$6,240	$26,391	$41,016	$54,337	$67,210	$130,878
INSERVICE EDUCATION						
Mean No. of Inservice Presentations Per Year	33.9	87.7	112.9	131.6	183.7	189.1
Average Duration in Hours	1.2	1.1	1.0	1.3	1.2	1.4
Average Attendance, All RNs	10.4	18.1	25.4	24.9	37.6	30.6
Annual Salary Cost Per Hospital for Training Staff	$3,437	$10,662	$15,950	$19,631	$24,717	$46,316
Annual Salary Cost Per Hospital for Participants	1,697	6,756	10,492	11,507	23,419	30,766
Total Annual Salary Costs Per Hospital	$5,134	$17,418	$26,442	$31,138	$48,136	$77,082

1. Combined Orientation and Inservice Costs, by Hospital Size Group and Region

In Table 7 and several other tables and graphs in this chapter, the data and cost estimates are aggregated by hospital size group to show the continuing effects of size group even when the numbers are reduced to common units. This effect is illustrated by the parallel trend shown in the table for average costs by patient day and by episode of illness (the latter determined by dividing annual costs by the number of discharges or admissions reported by the hospital). Both costs decrease with increasing hospital size until a minimum level is reached in the size group 300-399 beds, and both then rise for the larger hospital groups. This observation appears to be consistent with study findings indicating that the most cost-efficient size for a hospital ranges between 250 and 425 beds.[1]

The cost breakdown per patient day is shown graphically in Figure 3A by size group and in Figure 3B by region. The latter graph shows striking regional differences, with costs in Region IX (Pacific) nearly twice as high as costs in Region VI (West North Central). We are not certain of the full explanation for the difference, but a large part of it at least is attributable to differences in salary. As Table 8 shows, RN average starting salaries are higher in Region IX than anywhere else for all except one size group (the largest hospitals, where the Region II figure is higher). Salary ranges for training staff are summarized below:

	Orientation	Inservice Education
Hourly Salary Region IX	$4.44 - $7.11	$5.37 - $7.69
Hourly Salary Region VI	$4.21 - $5.71	$4.15 - $5.89

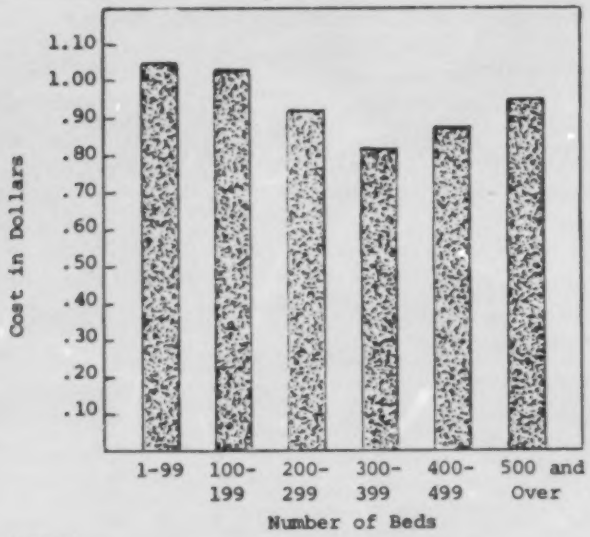
In the case of inservice education, we also found that reported average attendance at inservice presentations is somewhat higher in Region IX than elsewhere.

[1] James L. Pulley, Jr., and John G. Fulmer, Jr. "The Optimal Size Hospital," Hospital Administration, Spring 1975.

FIGURE 3

AVERAGE COMBINED COST OF ORIENTATION AND INSERVICE EDUCATION PER PATIENT DAY, BY HOSPITAL SIZE GROUP AND BY REGION

A. BY SIZE GROUP



B. BY REGION

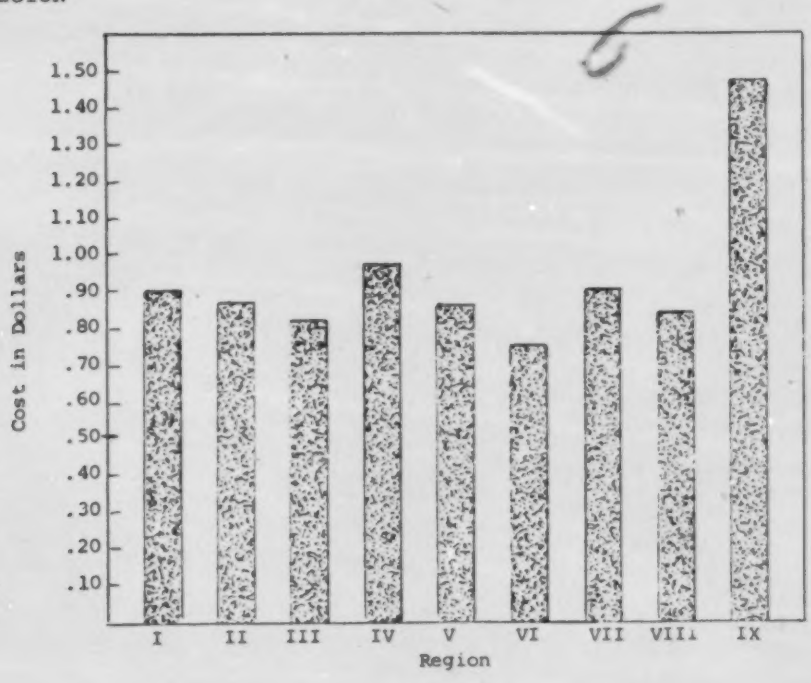


TABLE 8

AVERAGE HOURLY STARTING SALARIES
ALL NEWLY HIRED RNS
BY SIZE GROUP AND REGION
(Crosstabs, 394 hospitals; figures in dollars)

Region	Hospital Size Group					
	Under 100 Beds	100-199	200-299	300-399	400-499	500 and Over
I	3.73	4.19	4.32	4.73	4.53	4.65
II	3.62	3.79	4.64	4.61	4.30	5.54
III	3.97	4.30	4.19	4.38	4.23	4.20
IV	3.70	4.64	4.39	4.31	4.74	4.53
V	3.51	3.92	3.99	3.97	4.08	4.25
VI	3.62	3.93	4.13	3.93	4.53	4.37
VII	3.96	4.40	3.92	4.05	4.69	4.27
VIII	3.81	4.17	4.01	4.08	4.25	4.38
IX	5.13	4.77	4.65	4.96	5.14	5.09

2. Orientation Costs

This section presents our overall cost estimates for orientation and then examines the influence of basic preparation on differences in the orientation of inexperienced nurses. The data are drawn from Crosstabs Tables 1 (numbers of newly hired RNs), 2 (orientee hours for orientation), 3 (orientee hourly salary and salary cost for orientation), 4 (training staff hours for orientation), 5 (hourly salaries of training staff), and 6 (total orientee and training staff salary costs).

a. Total Salary Costs for Orientation per Newly Hired RN

A new RN in the study sample received between 84 and 154 hours of orientation, including both formal orientation to the hospital and orientation to the specific clinical unit, at a salary cost (orientee plus training staff) of between $770 and $984. Table 9 shows orientee and training staff hours and costs by hospital size group; the hours are shown graphically in Figure 4 and the costs in Figure 5.

As the table and figures show, combined orientee and training staff hours for orientation per new nurse fluctuate by hospital size group, with the number for the smallest hospitals nearly the same as for the largest. Costs also fluctuate, although here salary differences produce a distinction between the largest and smallest hospitals. In both cases, a clearer size trend is apparent if one looks at the orientee and training staff components separately: orientee hours and costs per new nurse increase steadily with increasing hospital size, while training staff hours and costs per new nurse decrease with increasing hospital size except in the largest size group. This decrease occurs despite the fact that larger hospitals report longer orientation periods (Table 9) and often higher training staff salaries. Apparently, economies of scale are achieved as training staff time is spread over a larger number of orientees. Despite the reversal of this trend in the largest hospitals, their training staff costs per orientee are still only a little more than half as high as those of hospitals with fewer than 100 beds (Table 9 and Figure 5).

The orientee component of total costs is examined in more detail in Sections b, c, and d, below, which present the study's findings on basic preparation and experience of new nurses and the relationship between preparation and orientee hours and costs for inexperienced nurses. We did not differentiate total (orientee plus training staff) costs by type of orientee preparation or experience since we did not know whether different categories of training staff (at different salary levels) distribute their time similarly among orientee categories. Training staff hours and costs per new RN were calculated without regard to RN preparation or experience.

b. Newly Hired Nurses by RN Category

Table 10, based on Crosstabs Table 1, shows the average number of newly hired RNs per hospital by RN experience and preparation. The percentage of newly hired RNs in each category is summarized by hospital size group in Figure 6. The following findings are of interest:

(1) More than half the nurses hired by hospitals in the largest size group are inexperienced, while fewer than a third of those hired in the two smallest groups are inexperienced. As discussed in Section C, below, this contributes to the increase in average hours of orientation per nurse observed with increasing hospital size.

(2) The proportion of returning nurses is highest in the smallest hospitals. We were initially surprised by this since we had expected that large teaching hospitals with university affiliations would provide refresher courses and thereby attract more mature nurses back to hospital positions. Apparently, however, the returning RN's choice of a hospital is governed more by location than by educational opportunities. Women returning to the work force after an absence while raising families tend to prefer jobs near home and tend also to live in suburbs, and returning RNs seem to follow this pattern.

(3) When the inexperienced group is examined separately, AD graduates are shown to account for a declining proportion of new hires with increasing hospital size, from about half of all inexperienced new RNs in the smallest hospitals to slightly under a third in the largest.

(4) Diploma graduates account for between a third and a half of the inexperienced group, with the highest proportion in medium-sized hospitals.

(5) The proportion of baccalaureate graduates increases sharply with hospital size, from one-tenth to one-third of inexperienced RNs. ("Other" inexperienced RNs reported by the hospitals are included in the baccalaureate category, but their numbers are extremely small.)

c. Orientation Hours by Experience Category

Table 11, based on Crosstabs Table 2, shows average orientation hours per RN by RN preparation and experience category for each size group and region. As shown, inexperienced nurses nearly always receive more hours of orientation than do nurses with recent experience; average hours for inexperienced nurses range from 124 in the smallest hospitals to 177 in the largest, while the range for nurses with recent experience is 65 hours to 118 hours. Thus, the large proportion of inexperienced nurses in large hospitals helps to explain the longer orientation hours per new nurse (all categories) reported by them. As the table shows, returning RNs also receive

TABLE 9

SUMMARY OF ORIENTATION HOURS
AND COSTS, ALL REGIONS, BY SIZE GROUP
(Crosstabs, 394 hospitals)

	Bed Size Group					
	Under 100 Beds	100-199	200-299	300-399	400-499	500 and Over
No. of New Nurses Per Year, All Levels	7.62	29.49	51.22	63.22	82.04	132.99
Combined Orientation Hours Per New Nurse	84	116	127	137	140	154
Training Staff Hours Per New Nurse for Orientation	110	70	47	45	30	42
Orientee and Staff Hours Per New Nurse	*194*	*186*	*174*	*182*	*170*	*196*
Average Salary Cost Per New Nurse	$279	$499	$550	$610	$636	$730
Average Training Staff Cost Per New Nurse	491	385	250	247	184	254
Orientee and Staff Costs Per New Nurse	*$770*	*$884*	*$800*	*$857*	*$820*	*$984*

NOTE: All categories of nurse experience combined.

FIGURE 4

TRAINING STAFF HOURS AND NEW NURSE HOURS FOR ORIENTATION:
ALL NEWLY HIRED RNS, ALL REGIONS
(394 hospitals, all regions)

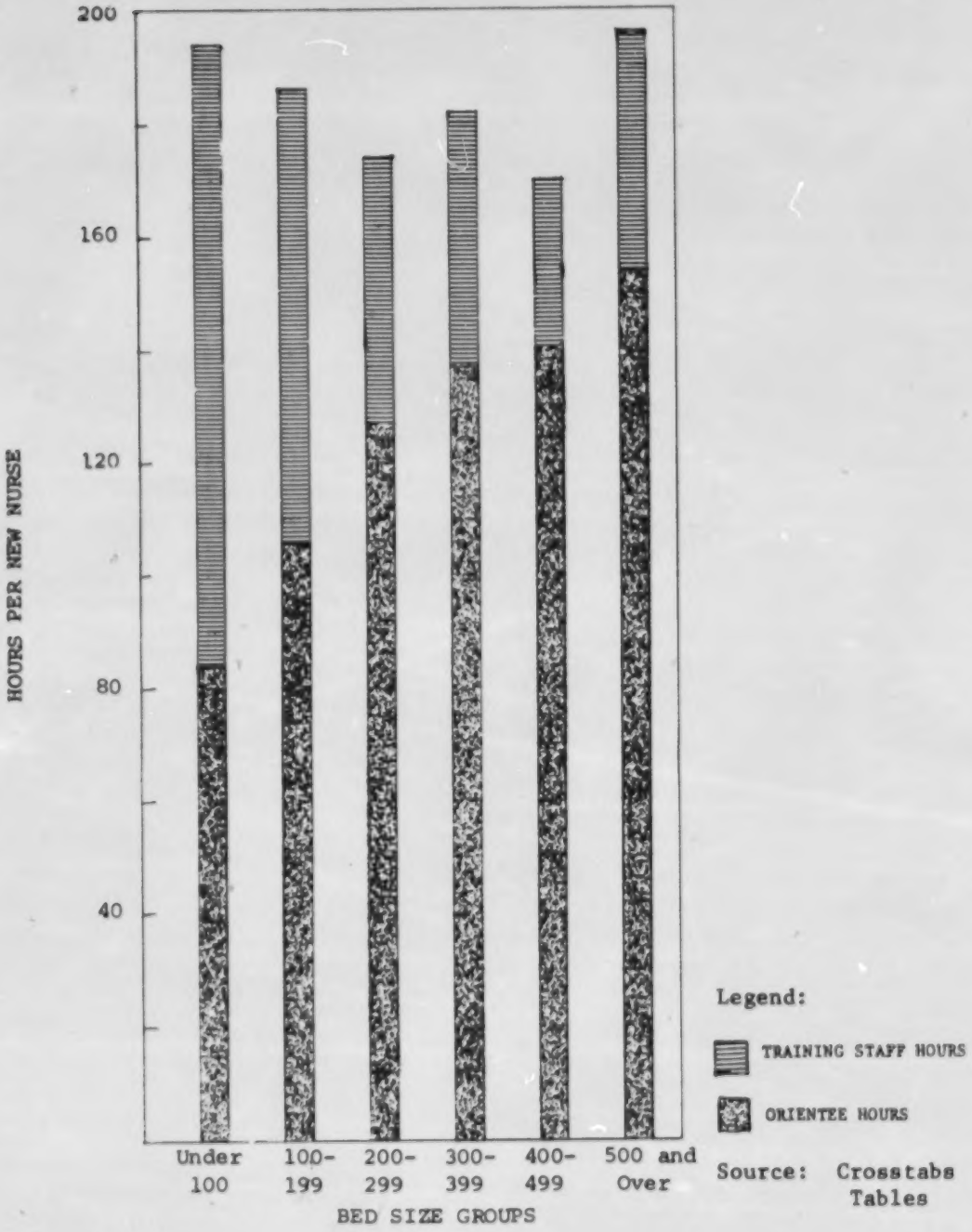


FIGURE 5

DIRECT SALARY COSTS FOR ORIENTATION:
ALL NEWLY HIRED RNS, ALL REGIONS
(394 hospitals, all regions)

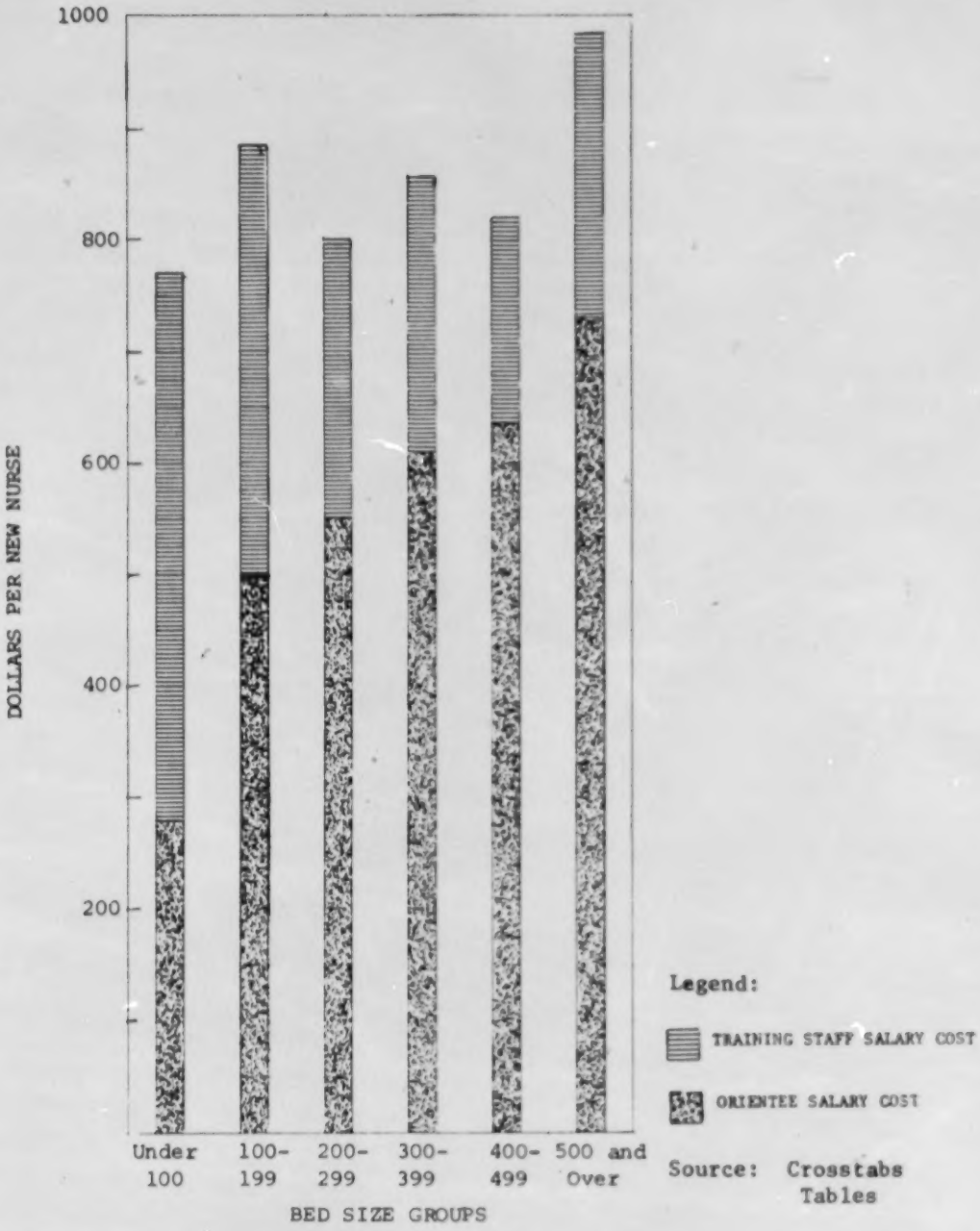


TABLE 10

AVERAGE NUMBER OF NEWLY HIRED RNS PER SAMPLE HOSPITAL
BY BASIC PREPARATION AND EXPERIENCE
(by region and hospital size group)

NOTE: Estimates are from Crosstabs Program using responses from 394 hospitals. Shading indicates cells for which a survey response rate of less than 25% decreases the reliability of numbers for individual categories of RN.

Region		Hospital Size Group: Under 100 Beds	100-199	200-299	300-399	400-499	500 and Over
All Regions	AD	1.30	4.15	7.60	7.89	9.77	19.59
	Diploma	0.85	3.53	7.56	12.23	16.22	26.64
	BA/BS	0.17	1.70	4.01	5.32	8.44	21.97
	Mean Total[1]	*2.32*	*9.36*	*19.98*	*26.19*	*37.18*	*69.01*
	Recent Experience	4.37	18.24	28.27	33.60	39.04	60.30
	Returning RNs	0.95	1.87	3.23	4.16	5.82	3.59
	Mean Total[2]	*7.62*	*23.49*	*51.22*	*63.22*	*82.04*	*132.99*
I	AD	1.67	0.60	**2.56**	5.71	6.50	20.50
	Diploma	4.00	6.80	**10.89**	23.00	23.50	39.25
	BA/BS	0.67	1.20	**1.22**	6.14	1.50	18.75
	Mean Total	*6.33*	*8.60*	***15.44***	*35.00*	*31.50*	*78.50*
	Recent Experience	7.33	20.80	**22.11**	28.14	35.50	43.50
	Returning RNs	0.67	1.60	**1.78**	5.43		4.00
	Mean Total	*14.33*	*31.00*	***39.44***	*68.57*	*67.00*	*126.00*
II	AD	**0.50**	5.78	7.67	6.13	14.00	20.47
	Diploma	**2.00**	7.33	10.93	15.87	22.71	28.34
	BA/BS		1.67	2.20	3.80	9.29	26.66
	Mean Total	***2.50***	*15.22*	*21.93*	*34.23*	*46.43*	*77.19*
	Recent Experience	**6.50**	17.44	26.20	29.20	25.43	58.19
	Returning RNs	**0.50**	3.33	3.07	5.40	8.57	2.09
	Mean Total	***9.50***	*36.22*	*50.00*	*60.40*	*80.43*	*137.59*
III	AD	**0.67**	4.22	13.20	12.18	9.33	24.75
	Diploma	**0.67**	4.00	1.90	11.64	10.67	21.50
	BA/BS		1.13	1.70	7.00	11.67	23.83
	Mean Total	***1.33***	*8.78*	*18.50*	*34.73*	*39.89*	*73.08*
	Recent Experience	**6.33**	11.89	38.80	38.64	50.11	76.08
	Returning RNs	**0.33**	1.78	3.40	4.00	2.33	3.92
	Mean Total	***7.67***	*23.67*	*60.70*	*73.09*	*92.33*	*153.08*
IV	AD	1.83	**2.75**	3.75	6.73	8.25	14.56
	Diploma	0.83	**1.50**	8.25	10.46	14.67	32.82
	BA/BS		**0.88**	4.00	4.64	3.42	18.70
	Mean Total	*2.67*	***5.13***	*16.67*	*21.91*	*29.42*	*67.04*
	Recent Experience	3.83	**17.00**	26.00	27.73	42.00	56.59
	Returning RNs	2.00	**1.75**	2.17	2.91	6.83	6.67
	Mean Total	*8.50*	***23.88***	*44.83*	*52.55*	*78.25*	*130.30*

[1] Mean for inexperienced nurses.

[2] Mean for all newly hired nurses.

TABLE 10 (continued)

Region		Hospital Size Group: Under 100 Beds	100-199	200-299	300-399	400-499	500 and Over
V	AD	2.50	6.75	24.00	19.00	10.00	19.00
	Diploma	0.75	2.50	15.00	3.50	22.67	38.00
	BA/BS	0.25	1.25	8.50	1.50	22.33	6.50
	Mean Total	*3.50*	*10.50*	*47.50*	*24.00*	*55.00*	*53.00*
	Recent Experience	2.50	8.25	5.00	28.00	21.00	37.00
	Returning RNs		1.00	3.50	1.50		4.00
	Mean Total	*5.75*	*19.75*	*56.00*	*53.50*	*76.00*	*94.00*
VI	AD	1.13	1.17	5.17	5.38	9.89	25.20
	Diploma	0.50	5.17	10.17	15.00	15.78	32.50
	BA/BS	0.38	0.83	6.00	8.38	8.67	13.10
	Mean Total	*2.00*	*7.17*	*21.67*	*28.75*	*34.56*	*70.80*
	Recent Experience	2.13	14.50	30.83	32.75	32.89	53.20
	Returning RNs	0.25	1.33	2.33	5.38	6.11	2.30
	Mean Total	*4.38*	*23.00*	*54.83*	*66.88*	*73.56*	*126.30*
VII	AD	1.50	4.50	15.50	8.75	21.00	12.10
	Diploma		0.75	2.00	9.75		11.90
	BA/BS		3.88	10.00	5.00	17.00	27.00
	Mean Total	*1.88*	*9.13*	*27.50*	*23.50*	*38.00*	*51.10*
	Recent Experience	4.00	22.75	8.00	43.75	23.00	59.10
	Returning RNs	0.25	2.13	16.00	3.00	3.00	1.80
	Mean Total	*5.75*	*34.00*	*51.88*	*69.50*	*64.00*	*112.50*
VIII	AD	1.75	1.80	13.25	8.00	4.00	25.00
	Diploma	0.50	3.20	1.50	4.50		9.00
	BA/BS	0.25	2.40	13.75	6.00	8.00	22.67
	Mean Total	*2.50*	*7.40*	*28.75*	*18.50*	*12.00*	*56.67*
	Recent Experience	10.50	18.60	39.00	57.50	54.00	92.33
	Returning RNs	1.75	0.60	3.75	1.00	1.00	2.00
	Mean Total	*14.75*	*26.60*	*71.50*	*77.00*	*67.00*	*151.00*
IX	AD	0.17	6.91	4.00	8.13	8.20	31.25
	Diploma	0.33	1.73	3.00	1.88	21.40	4.00
	BA/BS		1.73	4.67	4.00	6.00	21.00
	Mean Total	*0.50*	*10.36*	*11.83*	*14.63*	*38.83*	*56.75*
	Recent Experience	2.33	26.09	34.50	39.00	52.00	86.00
	Returning RNs	2.00	2.00	3.83	3.50	11.50	2.00
	Mean Total	*4.83*	*38.09*	*50.17*	*57.13*	*102.33*	*144.75*

TABLE 11

AVERAGE TOTAL ORIENTATION HOURS PER NEW NURSE BY BASIC PREPARATION AND EXPERIENCE (by region and hospital size group)

NOTE: Estimates are from Crosstabs Program using responses from 394 hospitals. Shading indicates cells for which a survey response rate of less than 25% decreases the reliability of numbers for individual categories of RN.

Region		Hospital Size Group: Under 100 Beds	100-199	200-299	300-399	400-499	500 and Over
All Regions	AD	142	182	168	189	215	200
	Diploma	98	116	154	151	154	160
	BA/BS	92	163	151	153	192	180
	Weighted Mean[1]	*124*	*154*	*161*	*163*	*180*	*177*
	Recent Experience	65	89	94	105	105	118
	Returning RNs	203	96	109	143	114	177
	Weighted Mean[2]	*84*	*116*	*127*	*137*	*140*	*154*
I	AD	115	154	230	177	198	183
	Diploma	88	108	181	174	264	130
	BA/BS	142	117	274	183	242	158
	Weighted Mean	*101*	*113*	*218*	*176*	*266*	*151*
	Recent Experience	73	116	81	121	176	94
	Returning RNs	58	112	128	145		136
	Weighted Mean	*85*	*116*	*144*	*153*	*219*	*132*
II	AD		130	196	159	176	174
	Diploma		133	123	139	134	166
	BA/BS		181	156	145	210	147
	Weighted Mean		*138*	*157*	*144*	*162*	*161*
	Recent Experience	28	77	95	104	101	126
	Returning RNs	28	56	119	118	126	153
	Weighted Mean	*32*	*101*	*124*	*130*	*136*	*150*
III	AD	44	144	126	189	327	166
	Diploma	114	90	140	157	182	130
	BA/BS		101	122	133	238	152
	Weighted Mean	*79*	*117*	*127*	*163*	*246*	*151*
	Recent Experience	42	76	79	97	109	96
	Returning RNs	64	84	101	113	174	132
	Weighted Mean	*95*	*98*	*104*	*128*	*166*	*127*
IV	AD	98	196	194	243	180	325
	Diploma	81	162	189	157	167	192
	BA/BS		175	186	162	188	231
	Weighted Mean	*93*	*188*	*189*	*184*	*169*	*232*
	Recent Experience	66	113	114	127	104	130
	Returning RNs	69	137	165	240	137	212
	Weighted Mean	*76*	*127*	*155*	*172*	*136*	*196*

[1] Mean for inexperienced nurses.

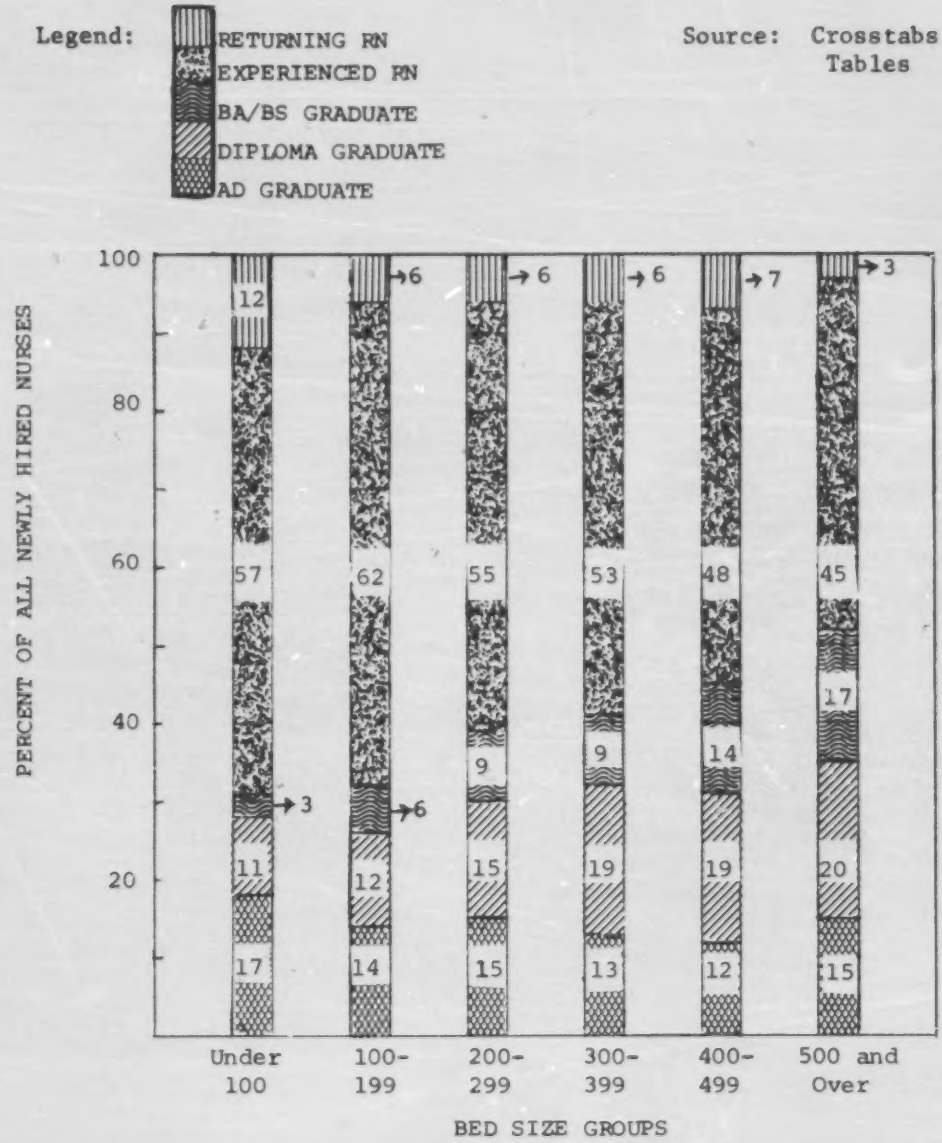
[2] Mean for all newly hired nurses.

TABLE 11 (continued)

Region		Hospital Size Group: Under 100 Beds	100-199	200-299	300-399	400-499	500 and Over
V	AD	196	169	319	324	106	218
	Diploma	156	101	229	217	139	176
	BA/BS	76	125	266	323	111	180
	Weighted Mean	*179*	*148*	*281*	*309*	*122*	*189*
	Recent Experience	118	107	549	155	127	130
	Returning RNs		147	251	211		279
	Weighted Mean	*138*	*134*	*292*	*219*	*123*	*173*
VI	AD	221	102	143	143	168	144
	Diploma	49	72	151	123	135	120
	BA/BS	69	81	173	116	155	116
	Weighted Mean	*172*	*78*	*156*	*125*	*150*	*128*
	Recent Experience	59	80	100	105	102	97
	Returning RNs	64	37	89	127	114	128
	Weighted Mean	*113*	*69*	*120*	*125*	*131*	*119*
VII	AD	92	211	32	154	151	276
	Diploma		189	33	145		124
	BA/BS		229	30	138	151	266
	Weighted Mean	*92*	*217*	*31*	*147*	*151*	*235*
	Recent Experience	44	99	24	102	71	154
	Returning RNs	92	109	30	146	111	131
	Weighted Mean	*98*	*135*	*31*	*119*	*118*	*192*
VIII	AD	85	127	159	92	176	77
	Diploma	125	90	146	76		79
	BA/BS	85	178	149	169	148	134
	Weighted Mean	*93*	*128*	*154*	*113*	*157*	*100*
	Recent Experience	51	89	117	92	96	65
	Returning RNs	133	15	149	235	56	40
	Weighted Mean	*75*	*39*	*153*	*112*	*84*	*78*
IX	AD	352	242	125	185	393	144
	Diploma	212	147	71	358	133	186
	BA/BS		100	76	220	300	143
	Weighted Mean	*258*	*203*	*91*	*212*	*222*	*146*
	Recent Experience	91	76	56	80	86	87
	Returning RNs	512	151	70	147	71	114
	Weighted Mean	*85*	*140*	*63*	*117*	*121*	*112*

FIGURE 6

PERCENT OF NEWLY HIRED NURSES PER SAMPLE HOSPITAL
BY PREPARATION AND EXPERIENCE
(394 hospitals, all regions)



extensive orientation; however, their share of the new nurse population (Figure 6) is much smaller than that of either nurses with no experience or nurses with recent experience.

d. Orientation Hours and Orientee Salary Costs for Inexperienced RNs, by Preparation

Figure 7 shows orientation hours, by hospital size group, for the three categories of inexperienced nurse, and Figure 8 shows the orientee component of salary costs for orientation, again by hospital size group and category of inexperienced RN. These findings are discussed below.

(1) Hours of Formal Orientation. The hours in Figure 7 are divided into those devoted to formal orientation to the hospital and those devoted to orientation to the specific clinical unit. We assumed that formal orientation hours would be constant for all types of new RN and did not ask the hospitals to report them separately for each type. As the figure shows, formal orientation hours per new RN vary directly with the size of the hospital, averaging about 20 hours in the smallest hospitals and about 40 in the largest.

(2) Hours of Clinical Unit Orientation. As Figure 7 shows, reported hours of clinical unit orientation per nurse vary somewhat by preparation category. Differences are as follows:

(a) On the average, facilities in all size groups report more hours of clinical orientation for AD graduates than for either of the other two new graduate groups, ranging from 121 hours in the smallest hospitals to 179 in the 400-499-bed category.

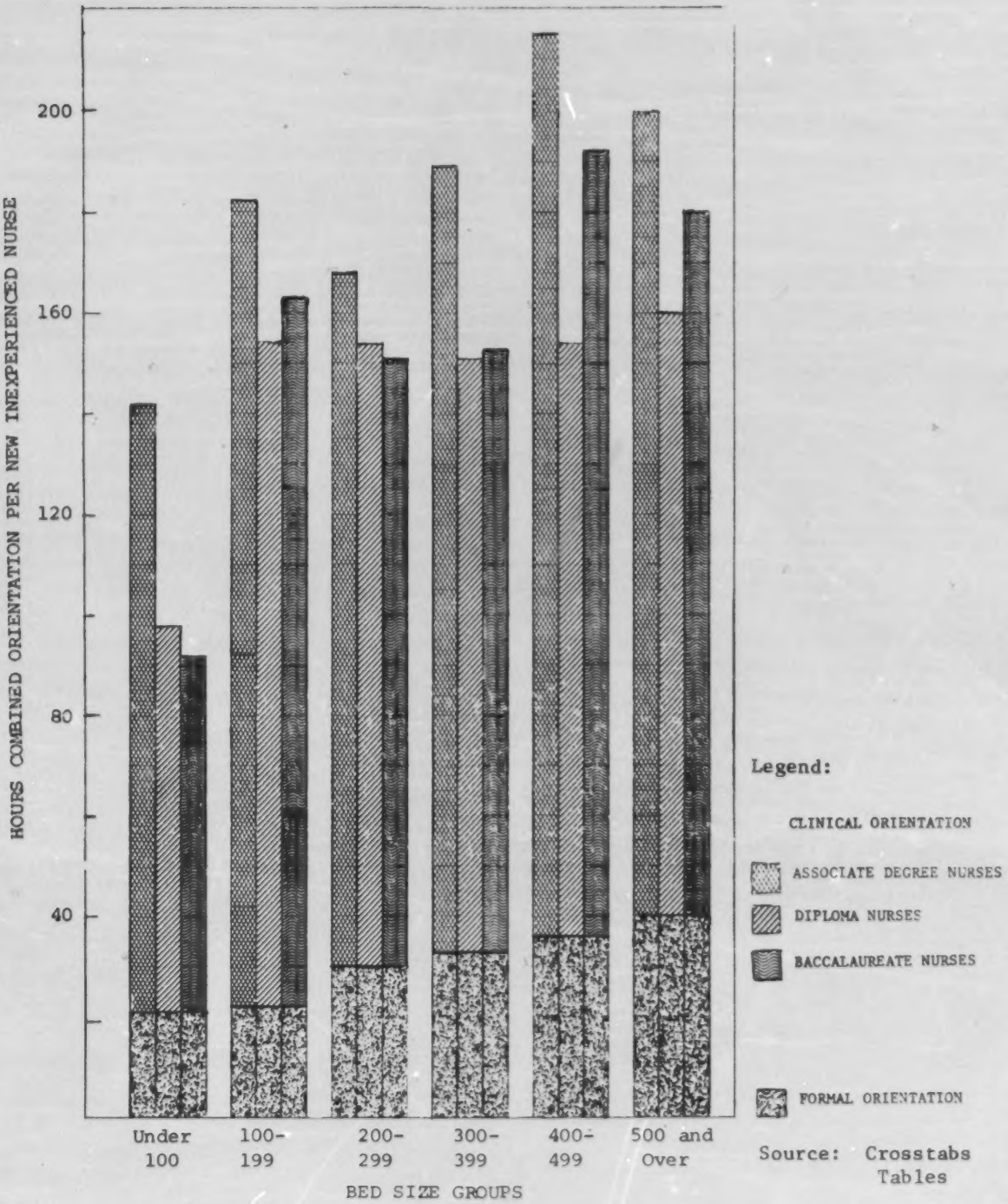
(b) Average clinical unit orientation hours for BA/BS graduates range from 71 to 156 hours in the same two size groups. Four of the six size groups report somewhat more clinical orientation for BA/BS graduates than for diploma graduates. However, one hospital stated that its reported hours include some time spent in preparing baccalaureate nurses to assume specialized duties or management responsibilities, and this may be true for other hospitals as well.

(c) Diploma graduates average 77 hours of clinical orientation in the smallest hospitals, ranging up to 120 hours in the largest ones.

These findings do not justify inferences about the quality of the three types of RN preparation. We have no way of knowing from the data whether the amount of orientation provided reflects the actual competence demonstrated by the new nurse or whether it reflects pre-existing views in the hospital concerning the three programs.

FIGURE 7

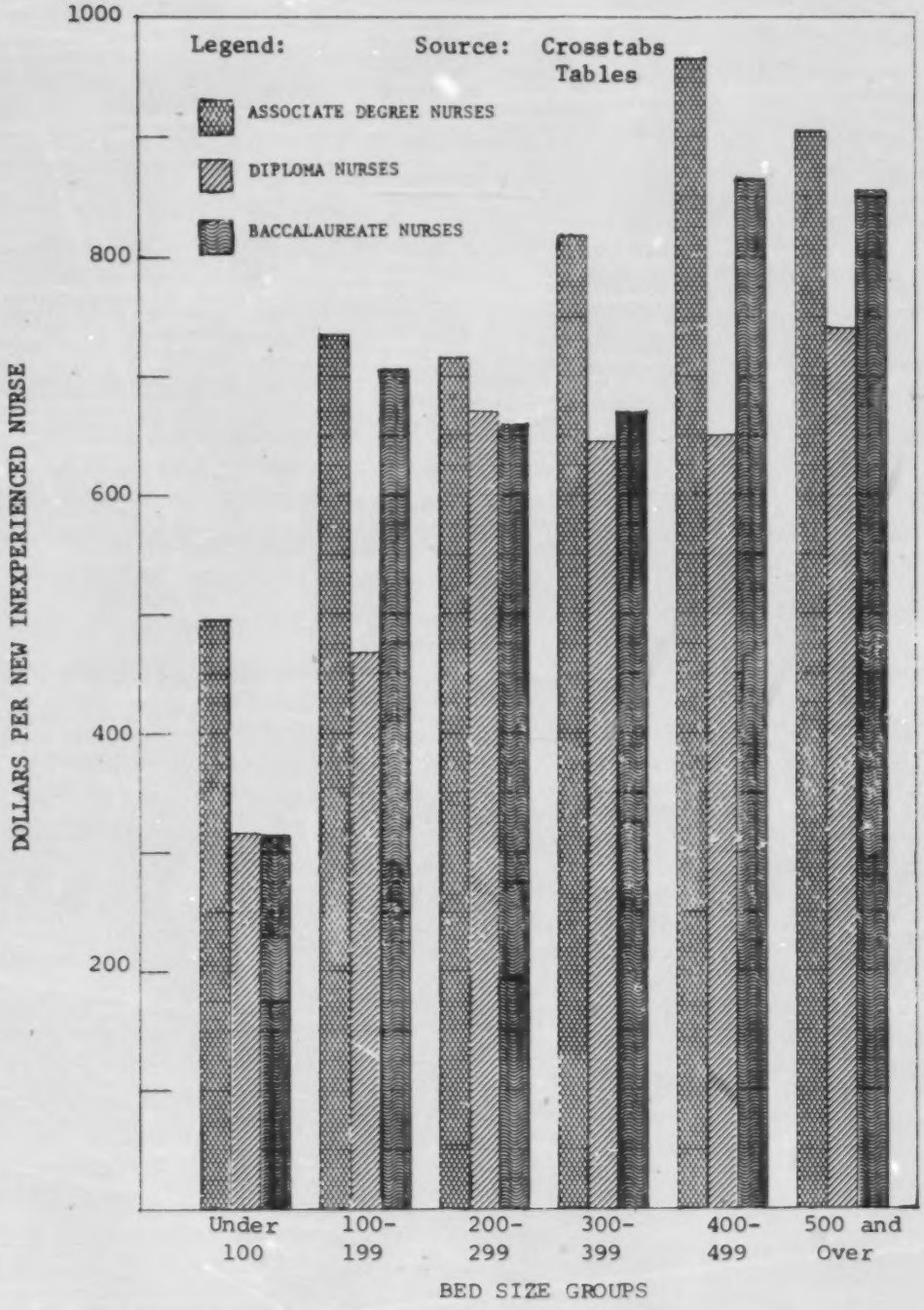
COMPARISON OF ORIENTATION HOURS FOR INEXPERIENCED NURSES, BY TYPE OF PREPARATION
(394 hospitals, all regions)



Source: Crosstabs Tables

FIGURE 8

COMPARISON OF ORIENTEE SALARY COSTS FOR ORIENTATION OF INEXPERIENCED NURSES, BY TYPE OF PREPARATION (394 hospitals, all regions)



The hours reported for clinical unit orientation are inevitably estimates since informal orientation and supervision are hard to differentiate. We found wide differences among questionnaire responses, suggesting that hospitals draw the line between the two activities at different levels. Further study to determine what truly constitutes orientation time would be a useful contribution to the understanding of in-hospital education and its costs.

(3) Orientee Salary Costs for Orientation. The cost differences by type of RN shown in Figure 8 show a pattern generally similar to that of hours in Figure 7. Changes in the pattern reflect salary differences shown in Table 12 (from Crosstabs Table 3). For instance, in the size group 100-199 the fact that diploma nurses have lower salaries as well as fewer orientation hours than other nurses makes the cost difference greater than the difference in hours. When the costs are averaged over all hospital size groups, differences by type of preparation are largely obscured. AD graduates and baccalaureate graduates show almost identical salary costs for orientation per nurse--$752 and $754 respectively--despite the fact that AD costs are higher in every size group. This is because of the relatively high concentration of AD nurses in small hospitals and of BA/BS nurses in large ones (Figure 6). Orientation periods (Figure 7) and new nurse salaries (Table 12) both increase with increasing hospital size; thus the higher costs for AD nurses within size groups are offset by the longer orientation periods and higher salaries of large hospitals when the groups are combined.

Examination of the questionnaire shows that some of the cost differences reflect salary differentials among the three types of RN within individual hospitals. Of the hospitals which reported salaries for more than one category of inexperienced new RN, 150 reported equal hourly salaries for all three types, and 41 hospitals that had not hired any baccalaureate nurses reported equal salaries for AD and diploma nurses. However, 118 hospitals reported paying higher salaries to BA/BS nurses than to either AD or diploma graduates or both, while three reported lower salaries for BA/BS than AD or diploma graduates. Eight hospitals reported higher hourly salaries for AD than for diploma graduates and two reported higher salaries for AD than BA/BS graduates.

3. Inservice Education Costs

Inservice education costs for participants and training staff are listed in Crosstabs Table 9 (Appendix D) by hospital size group and region. Data used in the calculation appear in Crosstabs Tables 7 and 8.

TABLE 12

NEW RN HOURLY SALARIES BY TYPE OF
PREPARATION AND HOSPITAL SIZE GROUP
(Crosstabs, 394 hospitals; figures in dollars)

	Hospital Size Group					
	Under 100 Beds	100-199	200-299	300-399	400-499	500 and Over
Associate Degree	3.62	4.10	4.10	4.28	4.43	4.61
Diploma	3.62	4.02	4.18	4.21	4.30	4.62
BA/BS	3.64	4.26	4.14	4.27	4.38	4.87
All Newly Hired RNs (including experienced)	3.87	4.30	4.34	4.42	4.55	4.78

a. Hours

On the basis of the frequency and duration of inservice presentations and the number of RNs attending, as reported by the hospitals, we determined average annual participant hours and training staff hours as shown below:

	Hospital Size Group					
	Under 100 Beds	100-199	200-299	300-399	400-499	500 and Over
Trainer Hours	609	1,920	2,721	3,246	3,794	6,951
Participant Hours	423	1,744	2,868	3,929	7,578	8,101
Ratio Trainer/ Participant	1.44	1.10	0.95	0.83	0.50	0.86

The progression of trainer/participant rations from a high trainer component in the small hospitals to lower one in the larger hospitals is consistent with our findings regarding orientation.

b. Salary Costs

The 40% of in-hospital education costs that can be assigned to provision of inservice education consists of direct salary costs only; as previously explained, fringe benefits and other costs were not obtained. In our study sample, inservice costs for each hospital were derived by a straightforward computation involving annual hours for inservice presentations, numbers of nurses in attendance, weighted averages of hourly salaries, and annual trainer salary costs. The weighting of participant salaries was determined by assuming that job categories would be represented in inservice training in proportion to their representation in the individual hospital's total RN population.

Table 13 shows average annual per-hospital salary costs for RN participants and training staff by hospital size group and region. Hospitals in all size groups report higher costs for trainer salaries than for participant RN salaries. This is partly accounted for by the higher salaries of training staff. However, as the preceding tabulation of inservice hours shows, training staff hours in some size groups approach or exceed participant hours. This is not surprising since

TABLE 13

AVERAGE ANNUAL SALARY COSTS
FOR PARTICIPANTS AND TRAINING STAFF
IN INSERVICE PROGRAMS
(Crosstabs, 394 hospitals)

Region		Hospital Size Group: Under 100 Beds	100-199	200-299	300-399	400-499	500 and Over
I	Participants	$ 1,059	$ 4,226	$ 8,178	$11,446	$13,748	$19,765
	Trainers	2,084	15,654	11,277	23,048	6,646	41,071
II	Participants	8,692	4,067	10,002	12,552	8,703	33,257
	Trainers	764	7,695	22,795	26,399	6,921	76,260
III	Participants	1,527	2,410	6,349	12,318	23,112	31,770
	Trainers	14,037	10,735	12,312	24,103	34,874	26,471
IV	Participants	1,378	7,751	16,141	8,422	15,927	41,644
	Trainers	2,223	11,485	22,216	12,961	35,991	27,160
V	Participants	841	7,810	4,715	17,067	9,671	21,530
	Trainers	4,359	6,120	6,089	9,636	18,634	27,658
VI	Participants	521	2,746	9,608	6,114	28,851	13,853
	Trainers	983	4,434	7,214	9,159	11,534	19,291
VII	Participants	2,543	7,767	6,688	17,668	2,935	14,286
	Trainers	1,620	13,170	8,188	15,720	6,431	50,735
VIII	Participants	1,601	5,890	10,527	7,876	30,600	18,572
	Trainers	4,049	8,404	8,701	7,660	19,040	50,703
IX	Participants	2,930	15,260	14,852	14,559	60,197	45,450
	Trainers	5,120	14,869	18,814	24,886	40,529	58,143
Total Annual Salary Costs Per Hospital For Participants In Inservice		$ 1,697	$ 6,755	$10,492	$11,507	$23,419	$30,765
Total Annual Salary Costs Per Hospital For Training Staff For Inservice		3,436	10,622	15,950	19,630	24,717	46,316
Total Annual Salary Cost For Participants And Staff For Inservice		$ 5,134	$17,418	$26,442	$31,138	$48,136	$77,082

only RNs are included in participant hours, while training sessions are attended by other staff such as LPNs, aides and orderlies. Also, training staff spend time in program planning and administrative activities that do not involve participants.

The boxes in the table show the 15 cells of the region - size group matrix for which trainer cost is lower than participant cost. It is not clear from our data whether this finding reflects some anomaly of reporting for those 15 cells, but since eight of the cells are in the two hospital size groups from 300 to 499 beds, it may be related to the already noted observation about cost-efficient hospital size.[1]

D. REGRESSION ANALYSIS

The initial regression analysis, in which the three dependent variables were total cost of orientation, inservice education, and the two combined, showed that the overwhelming effect on cost was due to hospital size. The two variables which reflect hospital size, number of new nurses and number of patient days, were highly correlated with each other and with cost. Subsequent analysis, using orientation, inservice, and combined costs per patient day as the dependent variables, identified additional effects from the following 16 variables:

(1) Number of new nurses (continuing effect of hospital size)

(2) New nurse workload (ratio of new nurse days to patient days)

(3) Percent hospital utilization

(4) Percentage of newly hired nurses with no experience who have diplomas

(5) Local government control index, either 1 or 0 for yes or no

(6) Region VI index, either 1 or 0 for yes or no

(7) New nurses as a percent of all RNs[2]

(8) Interaction between number of new nurses and new nurse workload

(9) Interaction between hospital utilization and new nurse workload

---

[1] Pulley and Fulmer op. cit.

[2] Total RNs were estimated conservatively by counting each reported full-time equivalent as one RN.

(10) Interaction between hospital utilization and percent new nurses with no experience who have a diploma

(11) Interaction between new nurse workload and new nurses as a percent of all RNs

(12) Interaction between hospital utilization and local government control

(13) Interaction between hospital utilization and new nurses as percent of all RNs

(14) Interaction between local government control and Region VI

(15) Interaction between new nurse workload and percent new nurses with no experience who have a diploma

(16) Interaction between new nurse workload and local government control

The relationships found between these variables and the cost results are as follows (Section 5 of Appendix C shows the quantitative results):

(1) Orientation costs per patient day increase when the number of new nurses is greater than average for the sample and increase even more when hospitals are under local government control. When new nurse workload is high, this effect is diminished. Greater hospital utilization increases costs; but as utilization increases, this effect is less pronounced. (When new nurse workload is heavy, both hospital utilization and number of new nurses combine with workload to reduce orientation costs.)

(2) Inservice education costs decrease when the majority of new nurses have no experience. When the new nurse workload and hospital utilization are high, however, this decrease is diminished. As hospital utilization increases, the cost of inservice education per patient day decreases, especially when new nurse workload is high. This effect is slightly diminished, that is, the reduction in cost is smaller, when the hospital is under local government control or the percentage of new nurses with no experience is high. A large percentage of new nurses with no experience who have a diploma has a slight lowering effect on inservice costs, unless new nurse workload is quite high. Interestingly, the analysis also showed that cost of inservice is lower if the hospital is in Region VI (the "West North Central" states of Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota and South Dakota), unless the hospital is under local government control.

(3) Combined orientation and inservice costs are increased if the new nurse workload is heavy. However, this effect is diminished if hospital utilization is high or the hospital is under local government control. If workload is low, local government control means higher costs. It appears that combined costs are lower for a hospital in Region VI. Costs are slightly reduced if there is a large percentage of new nurses with no experience who have diplomas.

In comparison to the effect of hospital size on total costs, the effects of these other variables on costs per patient day are small. The regression models do, however, give an indication of which variables affect costs in hospitals of the same size.

E. OTHER FINDINGS

1. Hospitals Having Orientation and Inservice Programs

The survey questionnaire (Questions 2 and 11) asked hospitals to indicate whether they had "identifiable programs" of orientation and inservice education. "Identifiable program" was defined on the questionnaire as "a program which is pre-planned, where the direction of the program is assigned, and which is recognized by the staff as a specified program."

The vast majority of hospitals said they did have such programs. As shown below, of the 394 hospitals in the sample, only 14 facilities (less than 4%) reported having no identifiable orientation programs; of these, nine were in the size group under 100 beds. Sixteen hospitals (again less than 4% of the sample) reported not having identifiable inservice programs, but five were contracting with nearby educational facilities for the service or had entered into cooperative arrangements with other hospitals. Only three hospitals (all in the smallest size group) reported having neither program.

	Number of Respondents Reporting Absence of Identifiable Programs					
	Under 100 Beds	100-199	200-299	300-399	400-499	500 and Over
All Regions						
Orientation	9	4	1			
Inservice	9	3	1	1	1	1

Since most of the respondents who said they had no identifiable program did report hours for orientation and inservice education, we believe that almost all hospitals do in fact conduct these activities, although some programs are less formal than was specified in the definition we used. It is possible that the proportion of hospitals with little or no in-hospital education is higher among hospitals that did not return the questionnaire. However, when we contacted some of these by telephone in our efforts to encourage response, we found that although many thought their programs were too informal or their records inadequate for purposes of our survey, they did conduct in-hospital education.

2. Presence of Diploma Schools

Of the 394 hospitals, 112, or 28.4%, reported having diploma programs. The percentage rose with hospital size as shown below.

Under 100 Beds	100-199	200-299	300-399	400-499	500 and Over
0%	3%	24%	38%	40%	45.7%

Our regression analysis looked for effects on costs from the presence or absence of a diploma program. We thought that if a significant proportion of new RNs were hired from a population already familiar with the hospital, costs of orientation might be reduced. However, the regression analysis did not show any such effects. We do not have sufficient data to determine whether this means that the diploma program does not affect orientation needs, that the proportion of new hires from the program is too small for costs to be affected, or that cost savings due to familiarity with the hospital are offset by increases due to some other factor.

In the course of editing for presence of diploma programs, we found that of about 50 hospitals queried, no fewer than eight had closed their diploma programs within the year.

3. Inservice Department Budgets

Of the 394 usable questionnaires, 193 had answers for Question 23: salary expense for the inservice department. The hospital size group 500 beds and over had the largest number of responses. As Table 14 shows, although the trend is toward increasing amounts with increasing hospital size, there was wide variation within size groups. Seven out of the 30 (23%) hospitals answering this question in the size group with 100-199 beds reported inservice department salary expenditures of $50,000 or more, while 15 of the 58 (26%) hospitals in the size group with 500 or more beds reported expenditures below that amount.

Because these expenditures vary so widely, we have not attempted to aggregate them or make calculations relating them to training staff costs based on hours and salaries or to total participant and training staff

TABLE 14

SIZE OF INSERVICE DEPARTMENT BUDGET
(as reported by 193 of the 394 hospitals)

Amount Budgeted	Number of Hospitals by Size Group						
	Under 100 Beds	100-199	200-299	300-399	400-499	500 and Over	All Size Groups
$99,999 and Over	0	1	0	0	2	14	17
$70,000 - 99,998	0	2	2	1	7	17	29
$50,000 - 69,999	0	4	3	9	10	12	38
$30,000 - 49,999	0	2	8	14	4	12	40
$10,000 - 29,999	2	17	22	12	4	3	60
$ 5,000 - 9,999	1	4	0	0	1	0	6
Under $5,000	3	0	0	0	0	0	3
Total Number of Responses	6	30	35	36	28	58	193

salary costs. Despite attempts to word the question carefully, we suspect that some respondents reported indirect costs in addition to salaries, or that differences in individual accounting systems resulted in mixed data.

4. Sources of Hospital Revenue

Table 15 displays the average percent source of revenue reported by hospitals by size group. Of our 394 respondents, 55 did not answer this question, stating either that the information was unavailable or that they did not wish to disclose it. For the rest, the contribution of Blue Cross as a percentage of total revenue is about the same in all hospital sizes. The contribution of Medicare to the smaller hospitals appears to be somewhat greater than to the larger ones, with a percentage spread of 11 points between the smallest and largest groups, and the contribution of Medicaid appears a little heavier in largest hospitals. Public funds in all account for about 46% of revenue in the smallest hospitals and about 41% in the largest. The proportion drops in the middle-size groups, but not by a large amount. To the extent that the budgeted amounts in Table 14 come from general hospital revenues, their sources are in the same proportions as above.

5. Difficulty of Funding In-Hospital Education

The questionnaire used in our pretest asked respondents whether they were limited in providing the desired quality of orientation or inservice education because of insufficient funds. Respondents all said that they were not.

We explored the subject further through telephone interviews both with pretest respondents and with training directors in other regions. The people with whom we talked said that since in-hospital education was recognized as an important activity by the hospitals and was accepted as reimbursable by third-party payers, the budgets they submitted were approved if reasonably well documented.

This question was not used in the final survey questionnaire, since it was clear that directors of nursing and hospital administrators did not perceive funding to be a major limitation on educational activities. An entirely different type of study would be required to judge the quality of education provided in order to determine whether funding is adequate for the activities that should be conducted.

6. Difficulty of Replacing Training Director

To obtain an idea of whether hospitals are experiencing a shortage of qualified training personnel, we asked (Question 17) how long they thought it would take them to find a qualified replacement for the person in charge of inservice education. Of the 374 hospitals that answered the question, 100, or 27%, indicated that the position would be very difficult to fill and would remain vacant for more than three months.

TABLE 15

AVERAGE PERCENT SOURCE OF HOSPITAL REVENUE
BY SIZE GROUP

(Crosstabs, 394 hospitals)

	Hospital Size Group					
	Under 100	100-199	200-299	300-399	400-499	500 and Over
Blue Cross	21.1	21.0	25.6	27.0	23.3	23.5
Other Private	19.1	27.2	22.1	22.1	27.7	21.4
Medicare	38.3	31.2	32.4	30.8	28.1	27.3
Medicaid	8.5	7.9	7.9	7.7	9.4	13.3
Other	14.3	14.4	12.1	12.9	12.6	14.8

Of the rest, 206 said the position would be vacant for two or three months, and 68 said they could fill the position immediately. Thus, while the majority of hospitals did not seem to feel that there was a serious shortage of qualified personnel, perhaps one-fourth did anticipate great difficulty in finding them.

7. Comments of Respondents

The questionnaire invited respondents to add their own comments. Many of these had to do with the complexity of the survey, leading us to condense it for our follow-up study of nonrespondents. Others concerned aspects of in-hospital education and the hospitals' programs, as discussed below.

A number of respondents reported extensive programs for LPNs and aides as well as for nurses. A few even expressed resentment that the survey was restricted to RNs, feeling that their educational activities for other nursing personnel had made significant contributions to the level of patient care.

Respondents described various innovative approaches to education. Some programs used audio cassettes and video presentations. Some hospitals had formed groups to contract with community colleges and universities for inservice education. Seven respondents sent us detailed descriptions and tabular information showing that they had extensive and highly organized programs. Others recognized the need for in-hospital education but regarded it as a burden; some, for example, said they regretted the loss of their diploma schools, which had provided them with student nurses who then stayed on as new graduates and required no orientation to the facility. A number of respondents commented that education represented a significant expense for them.

With respect to orientation, a number of hospitals indicated that they find new nurses less well-prepared to assume their duties than in the past. Several said they would favor a system in which new nurses served a period of internship before assuming the responsibilities of patient care. Many respondents expressed dissatisfaction with the preparation of associate degree nurses, and some said they would prefer not to hire AD graduates at all.

F. RECOMMENDED AREAS FOR FURTHER STUDY

This study is the first to develop nationwide estimates of the costs of in-hospital education on the basis of hours and salaries. We believe that our estimates give a reliable indication of the general magnitude of these costs, nationally and for hospitals of various sizes, and of the proportions accounted for by orientation and inservice education.

In order to obtain this overview of costs, we designed our survey to be as tolerant as possible of variations and gaps in the record keeping and reporting methods of hospitals with respect to in-hospital education. However, these variations and gaps do exist, and they limit

the precision of our estimates concerning individual components of costs. For some questions, such as hours of orientation, we expected that few hospitals would be able to report actual records; for others, such as training staff salaries, we were surprised that more than half the respondents had to rely at least partly on estimates.

Our results suggest four specific areas in which it would be desirable to have more complete and uniform cost data than can be obtained through current reporting systems. The data could be obtained by on-site investigation in a small group of hospitals. These areas are as follows:

1. The definition and duration of clinical unit orientation. There is no universal definition of where orientation leaves off and normal supervision begins; when we questioned some hospitals about the exceptionally long orientation hours they reported, they indicated that they were including as orientation whatever time was lost to patient care by the need to instruct the new RN, whether or not this occurred during an officially designated orientation period. Other hospitals (17% of respondents) apparently reported official orientation periods, since they indicated that the hours they listed were taken from hospital records. Investigation in this area would be aimed at developing a definition which both realistically reflects the time being spent introducing new nurses to their duties and can be easily used by hospitals to monitor this activity.

2. Training staff time devoted to both orientation and inservice education. A high proportion of our survey responses in this area were estimates. It would be useful to know the contribution of non-nursing as well as nursing personnel and whether training staff time is differentiated among different types of trainees.

3. Whether or not there are real differences in costs by type of RN preparation. Our cost results show some differences, but the high reliance on estimates of hours leaves open the possibility of some bias on the part of the responding hospitals. Improved data on hours of clinical unit orientation would help to answer this question. Data would also be needed on the type of preparation of nurses in inservice education; hospitals were not able to supply this information in the survey. Further accuracy would be achieved if training staff hours could be apportioned among the three categories.

It should be kept in mind that the existence of cost differences would not in itself justify conclusions about the merits of the three types of preparation. The cost differences might reflect hospital assumptions about orientation or inservice education needs rather than actual needs; or if nurses from one type of program do in fact need more in-hospital education in some areas, this may be offset by greater competence in other areas.

4. Which, if any, areas of clinical practice consistently require the most orientation effort and whether these differ by type of RN preparation. Are there specific areas of clinical practice in which the educational programs exhibit consistent "weaknesses," and do these vary among the three types of programs?

5. The amount of indirect and other costs properly attributable to orientation and inservice education. Our cost estimates include only direct salary costs. Approaches to determining indirect costs vary, and a study in this area would include developing a definition of what is to be included.

Several survey respondents commented that they would be interested in participating in a study of in-hospital education costs that would help them improve their record keeping and reporting systems for this activity. A joint project involving perhaps 10-20 hospitals could be undertaken with the dual objective of obtaining accurate data in the above areas and developing the reporting mechanisms needed to monitor this information in the future.

APPENDIX A

LITERATURE REVIEW

1. INTRODUCTION

A literature search was conducted for studies relating to:

- Definitions of "teaching activities" in hospitals. (For example, what is hospital orientation?)
- Descriptions of orientation and inservice education programs offered to RNs by acute care hospitals.
- Nursing "activity" studies--i.e., engineering studies of how long it takes a nurse to perform certain functions--with special reference to in-hospital teaching activities.
- Design of cost surveys in hospitals, especially if related to teaching activity.
- Statistical data of use to our study.

The following indexes were checked:

- International Nursing Index, Philadelphia: American Journal of Nursing, Vol. 1, 1966, through Vol. 8, No. 1, 1973.
- International Hospital Review, The Hague, Holland: National Institute of Hospital Consultants, Vol. 6, No. 1, 1968, through Vol. 9, No. 2, 1971.
- Cumulative Index to Nursing Literature, Glendale, California: Glendale Advantus Hospital, 1967 through March/April 1973.
- Abstracts of Hospital Management Studies, Ann Arbor, Michigan: University of Michigan, School of Public Health, 1970-1973.
- Hospital Literature Index, Chicago: American Hospital Association, 1970-1973.

The following book catalogues were inventoried:

- Countway Library, Harvard Medical School
- Boston College School of Nursing
- Boston University School of Nursing

Sharon Yenney reported in the Journal of Continuing Education in Nursing in 1972 that, "No statistics are available on the number of people involved in training and inservice education in health care institutions in the U.S. ..."[1] Our literature search indicates that this

---

[1] Yenney, S. L. "Help for Inservice Directors, Trainers and Educators," Journal of Continuing Education in Nursing, Vol. 3, No.1, January-February 1972, pp. 31-34.

is still true. The books, journals, articles, periodicals, and unpublished dissertations reviewed provided useful evaluative discussion of in-hospital education, as well as a variety of relevant data items (for example, trends in the proportions of nurses trained in AD, diploma, and baccalaureate programs), and one study reported overall inservice department costs, covering all staff, for 61 hospitals in Nebraska,[2] but no data were provided on numbers of hours or salaries involved in the in-hospital education of nurses. It therefore appears that there is a specific lack of this kind of information.

2. BIBLIOGRAPHY

Asterisks mark items for which notes appear in the next section.

American Hospital Association Guide to the Health Care Field, 1974 Edition.

American Nurses Association. Code for Nurses with Interpretive Statements, 1968, pp. 1-10.

------, Facts About Nursing 72-73, 1974.

Beekman, M. E. G. A. "The Need for In-Service Education for Nursing with Suggestions for Its Organisation," The LAMP, February 1972, pp. 20-21.

* Cooper, S. S., Ed. Critical Issues in Continuing Education, National Conference on Continuing Education in Nursing, October 18-21, 1971, University of Wisconsin, 1972.

* Copeland, H. "Change and Continuing Education," in R. W. McHenry, Ed., Ends and Means (cited below).

* Crancer, J.; Fournier, M.; and Maury-Hess, S. "Clinical Practicum Before Graduation," Nursing Outlook, Vol. 23, No. 2, February 1975, pp. 99-102.

* Curtis, F. S., et al. Continuing Education in Nursing, Western Interstate Commission for Higher Education, Boulder, Colorado, November 1969.

Dewey, B. E. "A Systematic Approach to the Improvement of Instruction," Journal, NYSSNTA, Spring 1972, pp. 11-16.

Dietrich, B. J. "Staff Development Through Regional Medical Programs," Journal of Nursing Administration, March-April 1971, pp. 14-19.

* Fleming, B. W.; Woodcock, A. G.; Boyd, B. T. "From Student to Staff Nurse: A Nurse Internship Program," American Journal of Nursing, Vol. 75, No. 4, April 1975, pp. 595-599.

---

[2] "Inservice Spending in Nebraska," Modern Healthcare, October 1974.

Foster, R. "Here's How Inservice Education Works," Modern Hospital, October 1970, pp. 95-98.

Germaine, A. "More on Inservice Education," Hospital Administration in Canada, Vol. 14, No. 9, September 1972, pp. 54-60.

Hess, M. A. "An Ongoing Inservice Education Program," Hospital Progress, July 1969, pp. 78-82.

Hoefflin, W. R. "To Have Better Personnel, Emphasize Training Programs," Hospital Management, August 1970, pp. 44-47.

Hutchison, D. J. "Inservice Education: Is It Really 'In'?" The Journal of Continuing Education in Nursing, Vol. 1, No. 1, May 1970, pp. 33-35.

"Inservice Education: How It Really Is," RN, February 1971, pp. 36-41.

* "Inservice Spending in Nebraska," Modern Healthcare, October 1974, pp. 69-71.

Institute of Medicine. Costs of Education in the Health Professions, Washington, D. C., National Academy of Sciences, January 1974.

Juzwiak, M. "How a Good Inservice Program Can Benefit You," RN, December 1967, pp. 37-45.

* McHenry, R. W., Ed. Ends and Means: The National Conference on Continuing Education in Nursing, 1970. Syracuse University, May 1971.

Medearis, N. D. and Popiel, E. S. "Guidelines for Organizing Inservice Education," Journal of Nursing Administration, Vol. 1, No. 4, July-August 1971, pp. 31-37.

* Miller, Sr. P. "Clinical Knowledge: A Needed Curriculum Emphasis," Nursing Outlook, Vol. 23, No. 4, April 1975, pp. 222-224.

Moore, M. A. "Staff Development for the Professional in the Nursing Service Department," Journal of Continuing Education in Nursing, Vol. I, No. 1, May 1970, pp. 26-32.

Morgan, D. M. "Continuing Education and Staff Development in Hospitals," Canadian Hospitals, November 1972, pp. 35-41.

Mullen, J. A. "The Development of Programs for New Employees," Supervisor Nurse, September 1971, p. 28.

* Murphy, J. S. "The Dilemma of Nursing Practice," Journal of Nursing Administration, Vol. 4, No. 1, January-February 1974, pp. 16-18.

* Naber, M. "Report on Study of Nursing Personnel Activity," Bulletin of the Wisconsin Nurses Association, Vol. XXXXI, No. 6, June 1972.

* National Commission for the Study of Nursing and Nursing Education. An Abstract for Action, New York, McGraw-Hill, 1970.

National League for Nursing, Publication No. 191568.

Neuman, M. M. "Employee Competency: The Goal of Inservice Education," Nursing Clinics of North America, Vol. 5, No. 2, June 1970, pp. 341-349.

Nichols, J. "The Need for Inservice Education for Nursing with Suggestions for Its Organisation," The LAMP, December 1971, pp. 31-43.

* Paduano, M. A. "Evaluation in the Nursing Laboratory: An Honest Appraisal," Nursing Outlook, Vol. 22, No. 11, November 1974, pp. 702-705.

* Pulley, J. L., Jr., and Fulmer, J. G., Jr., Ph.D. "The Optimal Size Hospital," Hospital Administration, Spring 1975, pp. 16-29.

Rockwell, S. M. "Inservice Education--What It Ought To Be: As the Experts See It," RN, February 1971, pp. 32-35.

Rudnick, B. R., and Bolte, I. M. "The Case for On-Going Inservice Education," Journal of Nursing Administration, March-April 1971, pp. 31-35.

* Simms, L. L. "The Role of the Practitioner in Continuing Education," in Continuing Education for Nursing/Tools and Techniques, Papers from 1968 convention of the American Nurses' Association, ANA, 1968, pp. 6-16.

* Squaires, G. M. "Administration and Organization of Continuing Education in Nursing," Proceedings Book: National Conference on Continuing Education for Nurses, School of Nursing of the Medical College of Virginia, Health Sciences Division of Virginia Commonwealth University, Williamsburg, Virginia, November 10-14, 1969.

* Tarsitano, B. J. "Perceptions of Hospital Personnel Regarding Continuing Education for the Hospital Staff Nurse," unpublished dissertation, University of Nebraska, Lincoln, Nebraska, 1971.

Walker, Sr. C. "Orientation and Staff Development in a General Hospital," AORN Journal, June 1969, pp. 56-59.

3. NOTES ON CONTENT OF INTEREST

Cooper, Signe S,, Ed. Critical Issues in Continuing Education, National Conference on Continuing Education in Nursing, October 18-21, 1971, University of Wisconsin, 1972.

Papers by Audrey F. Spector and Sister Jeanne Margaret McNally discuss the American Nurses Association Study on Continuing Education. The study was funded by the U.S. Public Health Service, Division of Nursing, with the purpose of surveying the programs and resources currently available

to registered nurses in order to identify the needs for continuing education and to determine a plan of action to enable the ANA to contribute to the updating of nursing practice. The study defines continuing education to cover educational programs with formal learning experiences to assist registered nurses in updating and enlarging their knowledge and skills in health care. The types of educational programs considered by the National Conference include short-term courses, conferences, seminars, institutes, workshops, clinical sessions, and programs using special media aids such as television and telephone conferencing. The study does not specifically consider inservice education programs, degree granting programs, or self-study programs. However, the study does realize the importance and necessity of these activities. The types of programs surveyed are sponsored by approximately 4,000 providers of continuing education for nurses; they include:

- Schools of nursing
- Hospitals
- Public Health Departments
- Professional organizations in nursing and allied health organizations
- Regional medical programs
- Voluntary health associations
- Regional education groups
- Federal government programs

The final report of the study is to be distributed to state nurses associations and to those involved in planning the activities to be initiated as a result of this project.

- Copeland, Harlan. "Change and Continuing Education," in R. W. McHenry, Ed., Ends and Means: The National Conference on Continuing Education in Nursing, 1970, Syracuse University, May 1971.

Inservice education "is that part of continuing education that is provided by the work organization for its members" (p. 108). Inservice education activities include orientation of new personnel, group instruction at workshops and conferences, coaching, apprenticeship, rotating job assignments, and on-the-job training.

The professional needs inservice education to supplement his self-directed learning. As an organization takes on new goals or seeks to improve health care delivery, inservice educational efforts become increasingly important. Administrative personnel must evaluate the staff's

ability to deliver this improved health care and to orient new personnel. Since a sizeable number of our professionals are not engaged in continuing education activities, should not institutions take the leadership in developing favorable attitudes towards learning? Inservice education provided by the institution is sometimes overlooked and underrated.

• Crancer, Joann; Fournier, Marie; and Maury-Hess, Sharon. "Clinical Practicum Before Graduation," Nursing Outlook, Vol. 23, No. 2, February 1975, pp. 99-102.

"In recent years, nursing service personnel have increasingly challenged nurse educators about why their graduates 'are not prepared to be skilled practitioners.' The educators have responded, 'If nursing service would use new graduates in the role for which they are prepared, nursing service would find it has capable practitioners.'" The article quotes D. E. Brodt (in the Journal of Nursing Education, April 1974) as stating that "many new graduates find the transition from education to service difficult and frustrating. They frequently are confronted with a work situation in which the measure of their responsibilities exceeds their competence and confidence."

The authors surveyed nurse employers in a metropolitan area and its surrounding communities to determine health facility needs and staff expectations for the new graduate. From this survey, an independent study practicum was developed collaboratively by nursing school faculties and staff members of participating health care facilities. This course was directed towards preparing students for the responsibilities they will encounter after graduation.

The independent study practicum has proved to be quite successful for several reasons. First, the staff can evaluate the students as possible employees; second, the new graduates when employed assume nursing responsibilities more rapidly because they are already familiar with the facility. The students increase their clinical competence and confidence, participate in one-to-one teaching situations, and improve their prospects for employment. One problem has emerged: a discrepancy between the associate degree program's objectives and the nursing service's expectations. Some nursing services expect AD graduates, who are trained to do basic bedside nursing, to assume team leadership responsibilities soon after employment. M. F. Kohnke (in the American Journal of Nursing, September 1973) has discussed the problem of nurse technicians placed in positions of responsibility and leadership for which they are unprepared.

• Curtis, Frieda S., et al. Continuing Education in Nursing, Western Interstate Commission for Higher Education, Boulder, Colorado, November 1969.

This publication represents (p. v) "the collective experiences and thinking of a regional group of nurse educators," all members of the

Continuing Education Seminar of WICHE's Western Council on Higher Education for Nursing. The authors believe that (p. 9): "Continuing education in nursing must be concerned with building upon basic nursing abilities and with challenging the nurse practitioner to develop new dimensions of adjustment to a changing society, while at the same time providing for liberation of the individual for maximum personal growth.... Effective educational programs in nursing are distinguished by the flexibility of their graduates and the ability of these graduates to contribute to the solution of health problems and to the betterment of society."

- Fleming, Barbara W.; Woodcock, Audrey G.; and Boyd, Beverly T. "From Student to Staff Nurse: A Nurse Internship Program," American Journal of Nursing, Vol. 75, No. 4, April 1975, pp. 595-599.

"The rapid expansion of knowledge in the technical and psychosocial sciences means that today nurses obtain only a basic foundation for practice in undergraduate programs. Each new graduate has a responsibility to learn to apply and expand her knowledge in the specific work role and setting. The employer has a responsibility to provide an opportunity for her to do this." To facilitate the transition from student to professional, the Department of Nursing at the Medical College of Virginia Hospital, in September 1970, established an internship program for newly graduated RNs.

To be eligible for the program, a nurse must have graduated from an approved nursing program and must have no more than six months working experience after graduation. Their participation in the program is voluntary. As interns, they hold staff nurse positions with full salary and benefits and the same responsibilities as other staff nurses. Interns in this program have been primarily baccalaureate nurses, although AD and diploma nurses have also participated. No major generalizations can be made about the interns' learning needs in relation to type of preparation. Therefore all interns, regardless of training, go through the same basic internship program.

- "Inservice Spending in Nebraska," Modern Healthcare, October 1974, pp. 69-71.

A survey of 61 Nebraska hospitals shows that 35 have budgets for training and education (including nursing and other staff) ranging from $250 to $160,000 annually. The data support the assumption that financial commitment to inservice education is proportional to bed size. Of the hospitals with no training budgets, most had fewer than 50 beds, though one was in the 300-600-bed category. The survey asked hospitals to identify staff responsible for inservice education. The responses suggest to the authors that while staff providing education may be highly qualified in the subjects they teach, not many are well-qualified as educators.

• McHenry, Ruth W., Ed. Ends and Means: The National Conference on Continuing Education in Nursing, 1970, Syracuse University, May 1971.

Papers by Betty Gwaltney and Dr. Charles H. Russell discuss the recommendations of the First National Conference on Continuing Education for Nurses and issues emerging from the Conference. The Conference recommended that: "the relationship between continuing education programs and in-service programs be carefully considered not only as co-existent but also as simply different facets of the same thing, namely, adult education for nurses." Some conference members encouraged the development of clearer definitions of the two areas of education, while others recommended coordinated working relationships in an attempt to avoid duplication and make better use of resources.

Reactions to the Commission's findings on continuing education focused on a strong agreement that new aspects of health care and delivery are going to increase the number and variety of inservice education efforts.

• Miller, Sr. Patricia, Associate Professor and Chairman, Graduate College of Nursing, University of Nebraska Medical Center, Omaha. "Clinical Knowledge: A Needed Curriculum Emphasis," Nursing Outlook, Vol. 23, No. 4, April 1975, pp. 222-224.

"Nursing education should have as its end product nurses who can use the information they have acquired in meeting the health problems of the patient in the practical setting. Programs which severely limit the amount of clinical experience for students or which operate on the premise that students make their own best teachers need to take a long, hard look at the complexity of decision making...and at the factors necessary for transfer of information from theory to actual practice."

• Murphy, Jeanne S. "The Dilemma of Nursing Practice," guest editorial adapted from a talk at the mid-year of the Massachusetts League for Nursing, Journal of Nursing Administration, Vol. 4, No. 1, January-February 1974, pp. 16-18.

Little differentiation has been made in the duties and responsibilitie of the two-, three-, and four-year nursing school graduates. All participate in an orientation to the hospital and nursing service, after which they are designated as staff nurses with the same responsibilities, privileges, and obligations regardless of educational preparation.

The preparation of nurses is as varied as the number and types of nursing programs from which they were graduated. Some will be strong in theory but have limited clinical experience; some will be fairly comfortable with the patient and most of the procedures for care. All will need time and help in adjusting to the responsibilities expected of staff nurses. Head nurses, patient care coordinators, and nursing directors recognize how unfair it is to ask new graduates to perform as team members and to

carry out assignments for patient care before they have had time to learn and adjust to nursing responsibilities.

It is also unfair to expect head nurses to accept as new members of their staff nurses who have never catheterized a patient, have never given medications, have never cared for a patient with an infusion, have never suctioned a patient, or have never had an opportunity to learn daily patient care procedures. One study of four departments of nursing service reported the need for $145,000 to provide replacement staff for personnel participating in orientation sessions or classes to upgrade their skills with a view toward assuming added responsibilities.

- Naber, Mary. "Report on Study of Nursing Personnel Activity," Bulletin of the Wisconsin Nurses Association, Vol. XXXXI, No. 6, June 1972.

This paper discusses a time-and-motion study of nursing personnel activities on ten medical/surgical units at St. Joseph's Hospital in Milwaukee, Wisconsin. Nine major categories of activity, including "staff development," were studied through round-the-clock observation and the data processed by computer. The study was still in progress at the time this article was published.

- National Commission for the Study of Nursing and Nursing Education. An Abstract for Action, New York, McGraw-Hill, 1970.

"Even as a few schools are beginning major curricular overhauling, some critics are suggesting that the collegiate schools are preparing 'well-rounded nurse generalists' when they should be producing 'highly skilled specialists.' Similarly, there are criticisms of the separation of collegiate nursing education from nursing practice and direct patient care - the feeling that collegiate educators have overplayed their hands in divorcing nursing education from the hospital or from other health care facilities" (pp. 37-38).

"Anecdotal comments abound that the associate degree graduates are not as competent as hospital school graduates. Some would even suggest that the hospital school nurses are superior to baccalaureate graduates who are steeped in theory but short on practice" (p. 107).

The Commission points out that some differences in competence of new nurses might be expected simply from the difference in duration of programs - two, three, or four years. To see whether there are such differences and examine their extent, Commission staff studied the results of New York State professional nursing examinations held in 1968. The study found that there were identifiable patterns in performance related to program length and type. The associate degree students placed lower on the average on the nursing examinations than the diploma students who, however, scored lower than did the baccalaureate students. However, there

was a great deal of overlap among the three programs and variations in scores were as great within programs as among them.

The Commission anticipates that greater differences would be apparent if clinical performance were compared among nurses from two-year and three-year programs. However, the differences would probably still be less than differences within a program type, and hospitals must be prepared for the latter differences in any case.

In surveying nursing organizations and other groups, i.e., health care field, the Commission found "almost unanimous agreement" on the need for increased emphasis on inservice and continuing education for nurses as a result of changes in technology, health care practices, and the social environment (p. 122). The Commission found that such efforts are inadequately supported. "Of the more than 7,000 hospitals in the United States, for example, no more than 300 have a professional training specialist to direct their inservice program" (p. 123). Too much responsibility has been placed on the individual nursing service. Among the Commission's recommendations is that (p. 123): "Health care facilities, including hospitals, nursing homes, and other institutions, either individually or collectively through joint councils, provide professional training staffs to supervise and conduct in-service training and provide released time, facilities, and organizational support for the presentation of in-service nursing education as well as that for other occupations."

• Paduano, Mary Ann. "Evaluation in the Nursing Laboratory: An Honest Appraisal," Nursing Outlook, Vol. 22, No. 11, November 1974, pp. 702-705.

In an attempt to determine the value of clinical evaluation in introductory nursing courses, Pace University in New York has set up a nursing laboratory which would enable the faculty to evaluate the student's clinical skills. Initially the program was not successful because of the difficulties involved in measuring clinical competence and the artificiality of the laboratory setting. Future efforts will be geared toward evaluation both in the laboratory and hospital settings. Standard parameters must be developed upon which to judge performance so that evaluation is not subject to the whims of individual personalities; in the initial program one student complained that an instructor taught the students one way of doing something and the evaluating instructor then failed a student for not doing it another way.

• Pulley, James L., Jr., and Fulmer, John G., Jr., Ph.D. "The Optimal Size Hospital," Hospital Administration, Spring 1975, pp. 16-29.

Using regression analysis to hold constant four major sources of variation in hospital costs--service capability, training and research activity, factor prices, and efficiency--a fifth major variable, hospital size, was examined to isolate the relationship between size and average cost. A model was developed to test the hypothesis that average cost

curves with respect to size of hospital are "U" shaped. At 1971 costs, the optimum size hospital was 279 beds and at 1972 costs it was 346 beds. The optimal size hospital depends to some extent on level of demand for services, but demand is apparently slowing, and on the basis of this study one would hesitate to increase the size of a facility much beyond 350 beds if the intention is to stay within what appears to be an efficient size range.

• Simms, Laura L. "The Role of the Practitioner in Continuing Education," in Continuing Education for Nursing/Tools and Techniques, Papers from 1968 convention of the American Nurses' Association, ANA, 1968, pp. 6-16.

"Preservice education for the professions is generally regarded as a means of laying the foundation for long-term growth and ultimate contribution, rather than imparting immediate "know-how" and strictly technical skills. It aims to develop the powers of understanding and critical analysis; to cultivate an insatiable appetite for learning; to train students to deal with the realities of today by drawing upon knowledge accumulated in the past, while keeping an eye to the future" (pp. 7-8).

• Squaires, G. Marjorie. "Administration and Organization of Continuing Education in Nursing," Proceedings Book: National Conference on Continuing Education for Nurses, School of Nursing of the Medical College of Virginia, Health Sciences Division of Virginia Commonwealth University, Williamsburg, Virginia, November 10-14, 1969.

"More and more we see health agencies assuming the financial responsibility for their own staff members. If we are going to improve nursing practice, it will be necessary for every health agency to develop realistic educational budgets to meet these needs of their staff members and to pay their salaries while they are away studying."

Inservice education, defined as those learning activities provided by an agency for its own employees, often unfortunately consists of no more than an individual hospital orientation program. Inservice educators should encourage staff to participate in university continuing education programs; in some places, community colleges are cooperating with hospitals in their ongoing inservice education programs.

• Tarsitano, Betty J. "Perceptions of Hospital Personnel Regarding Continuing Education for the Hospital Staff Nurse," unpublished dissertation, University of Nebraska, Lincoln, Nebraska, 1971.

Research activities in industry often reveal an imbalance in emphasis between the development of technical and social skills. This imbalance also seems to be true of the nursing profession. Technical skills generally become well developed and frequently are promoted by various inservice

programs; however, social skills which require the capacity to receive communication from others and to respond to this communication in a manner which promotes mutual participation in a common task have been poorly developed. According to the Code for Nurses, registered nurses must be aware of the need for continuous updating and expansion of the body of knowledge on which a practice is based, and must keep their knowledge and skills current by whatever means are appropriate and available to them. Workshops, inservice education, academic study, professional reading, and conferences should be incorporated into this continuing educational process. This dissertation voices a concern within the nursing profession.

APPENDIX B

1. ORIGINAL QUESTIONNAIRE AND COVER LETTERS
2. REVISED QUESTIONNAIRE AND COVER LETTER

1. ORIGINAL QUESTIONNAIRE AND COVER LETTERS (Sent to the hospital's Director of Nursing; copy to the Administrator)

October 1974

Dear Director of Nursing Service:

As indicated in the enclosed letter from Jessie M. Scott, Director, Division of Nursing, Bureau of Health Resource Development, there is a major need to understand more fully the scope of effort and cost associated with in-service education carried out in hospitals to maintain and improve the quality of nursing and delivery of health care.

To obtain the data we need for regional and nationwide projections, we have carefully selected a sample of hospitals on the basis of location and size. Your hospital has been selected for very specific characteristics necessary to ensure a balanced, representative sample. As a result, your response is vital to our survey.

In an effort to save your time and to provide as simple a questionnaire as possible, we have asked only for data that will be utilized for our statistical analysis and projections. We are asking for breakdowns of data where possible; in any case, please provide totals. If you have any questions about the questionnaire, please call me collect at (617) 864-5770, Extension 3331, and I will endeavor to clear them up for you.

We suggest that you and the Administrator and/or Fiscal Officer of your hospital review the questions 21 through 29 on pages 23 and 25 of the questionnaire together, if necessary. Because of the need for interdepartmental cooperation, we are sending a cover letter to the Administrator.

Please return the questionnaire to us within three weeks of receipt with as much of the requested information as you can obtain.

We assure you that:

(1) Any data you submit will be held in strict confidence and will be seen by the study staff only, and

(2) Your program will not be identified with its cost in any published report of the survey. A master file of the hospitals with the associated code numbers will be kept in the study office and will be destroyed at the completion of the study.

We will supply the Bureau with summaries of the study results. We will notify you of any publications that result from this study.

Sincerely,

Suzanne H. Kase

Suzanne H. Kase, RN
Project Director

89

October 1974

Dear Hospital Administrator:

Arthur D. Little, Inc., has entered into a contract with the Division of Nursing, Bureau of Health Resource Development, DHEW, to conduct a survey designed to secure information on the costs to hospitals of providing orientation training and other types of in-service education for registered nurses.

The American Hospital Association agrees with the need for the data and is interested in the results of this study. The American Nurses Association promotes the desirability and necessity of these types of educational programs in hospitals. The Joint Commission on Accreditation of Hospitals has a requirement that hospitals carry out these programs for their nursing staff. Yet very little is known about the costs to hospitals of meeting continuing educational needs of nurses.

To carry out this project, a sampling method to provide data for analysis as the basis for regional and national projection has been designed. Your hospital has been selected for specific characteristics necessary to ensure a balanced, representative sample. As a result, your response is vital to our survey.

We have sent under separate cover, addressed to the Director of Nursing Service, a questionnaire to elicit the data needed. The questionnaire has been designed for completion with minimum effort on the part of your staff. One portion calls for data which might best be obtained from yourself or your Director of Fiscal Affairs, and we have suggested that the Director of Nursing obtain this information from the appropriate source if she does not have it available.

Any data you submit will be held in strict confidence and will be seen in its original form only by the study staff; your program will not be identified with its cost in any publication resulting from the study. The Bureau of Health Resource Development will receive summaries of the study findings. No hospital identification will be included. We will notify you of all resulting publications.

If you have any questions, more detailed information has been provided to the Director of Nurses. We and the Bureau of Health Resource Development will be most appreciative of your support.

Sincerely yours,

Suzanne H. Kase

Suzanne H. Kase, RN
Project Director

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
PUBLIC HEALTH SERVICE
HEALTH RESOURCES ADMINISTRATION
BETHESDA, MARYLAND 20014

BUREAU OF HEALTH RESOURCES DEVELOPMENT

October 1974

Dear Director of Nursing Service:

The Division of Nursing, USPHS, has entered into a contract with Arthur D. Little of Cambridge, Massachusetts, to conduct a survey designed to secure information on the costs to hospitals of providing orientation training and other types of in-service education for registered nurses.

The American Nurses Association and the American Hospital Association both promote the desirability and necessity of these programs in hospitals. The Joint Commission on Accreditation of Hospitals has as a requirement of accreditation that hospitals carry out these programs for their nursing staff. Yet very little is known about the costs to hospitals of meeting continuing educational needs of nurses.

The enclosed questionnaire has been designed to acquire basic information for determining these costs. It has been prepared under the direction of Suzanne Kase, RN, Project Director, of the Health Care Planning and Management group of Arthur D. Little, Inc. Your response will become part of essential information for the Division of Nursing which will be utilized in decisions on the most appropriate location and source of funding for these programs, and on decisions concerning the basic and continuing educational needs of nurses.

Your assistance in this survey will be very much appreciated.

Sincerely yours,

Jessie M. Scott

Jessie M. Scott
Assistant Surgeon General
Director, Division of
Nursing

91

OMB Clearance Number 68-S73052
Expires July 31, 1975
Contract Number NO1 NU 34082

QUESTIONNAIRE TO DETERMINE COSTS OF ORIENTATION AND INSERVICE TRAINING FOR RN'S

76036

OCTOBER 1974

SUZANNE H. KASE, RN
Project Director

I.D. _____

92

68-S73052

Expiration Date - July 1975

QUESTIONNAIRE TO DETERMINE COSTS OF ORIENTATION AND INSERVICE TRAINING IN HOSPITALS FOR RN's

OCTOBER 1974

Please return to: Suzanne Kase, RN

HOSP. ID NO._____

93

GUIDANCE FOR FILLING OUT THE QUESTIONNAIRE

1. Introduction

The purpose of this questionnaire is to obtain data which will allow us to calculate the costs incurred by hospitals for their orientation and in-service programs.

If we know, for orientation and for in-service, the number of RN's receiving it and the number of hours spent receiving and their salaries, we can calculate hospital costs for RN's to attend programs. If we also know staff hours devoted to the administration, preparation, and conduct of these programs, and their salaries, we can calculate staff costs to give the programs. We then can sum the RN's costs to attend and the staff costs to give these programs, thus determining total costs for your programs.

The bulk of the questions (up through question 17) ask for information allowing us to calculate these costs. Most of the rest of the questions are those for which you may want help from the accounting department--questions on hospital discharges, bed-days, costs of personnel, and source of revenue.

Although the questionnaire looks long, we have given you instructions for most questions, which lead you, step by step, through the information asked, to assist in filling out the questionnaire, and to make the task as easy as possible for you. If you have a problem, or a question which is not answered by the instructions, please feel free to call us collect. The names and telephone numbers to call at Arthur D. Little, Inc., are:

Ms. Suzanne Kase: (617) 864-5770, ext. 3331

Ms. Elaine Israel: (617) 864-5770, ext. 3347

This information will be aggregated with that of other hospitals, so these data will never be associated with your hospital. We will, however, notify you of any publications resulting from this study.

2. Instructions

Please answer every question, unless you have been instructed to skip it. If you do not have data broken down into the categories we have listed, please give us a total and/or your estimate (as a %, if you wish). Likewise, if you do not have records for a question, please estimate as best you can. Feel free to make comments in the margins if you need to explain a figure. If you do have records, please refer to them in answering questions. In other words, we want the most accurate data we can get; however, estimates are better than no data at all.

The numbers in italics, in parenthesis, on the right side of each page should be ignored as they are for use by ADL in computerizing the responses.

94

DEFINITIONS AND INSTRUCTIONS FOR QUESTION 2

Identifiable Program: Refers to a program which is pre-planned, where the direction of the program is assigned, and which is recognized by the staff as a specified program.

Orientation Program: Refers to a program given at time of employment where a newly hired RN receives information necessary for her to function in the new job setting. Includes overall hospital orientation, nursing service orientation and clinical unit orientation (for examples, see page 8, Definitions and Instructions).

DEFINITIONS AND INSTRUCTIONS FOR QUESTION 3a

RN's: Registered nurses licensed to practice in the state. They may also be hired in an RN position awaiting State Board Examination results. Foreign graduates may not be included unless licensed.

STUDY COSTS OF IN-HOSPITAL ORIENTATION TRAINING AND OTHER TYPES OF IN-SERVICE EDUCATION FOR REGISTERED NURSES

(To be completed by Director of Nurses or her delegate at survey hospital)

(6-7)

1. We would like you to use the most recent year for which you have year-end data when answering each of the questions below. Please note here the year you will be using: 19 ___ ___ *(8-9)*

ORIENTATION

2. Does this hospital have an identifiable orientation program for the department of nursing? *(Please note definitions on page 2 and check one.)*

___ 1. Yes ___ 2. No *(10)*

3. a. In the year given above, how many full-time and part-time RN's did you hire in all? *(Please note definition on page 2. If none, please write "0" and skip to Question 13.)*

No. of RN's _____ *(11-13)*

b. Is this figure entirely from your records, partly from your records and partly estimated, or solely an estimate? *(Please check one.)*

__ 1. Records only __ 2. Both records/estimate

__ 3. Estimate only *(14)*

DEFINITIONS AND INSTRUCTIONS FOR QUESTION 4a

AD: RN's prepared in a two year academic program granting an Associate Degree in Nursing.

Diploma: RN's prepared in a two to three year program in a hospital school of nursing. No academic degree granted. Include foreign educated RN's in this category if educated in a hospital school.

BA/BS: RN's prepared in a four to five year academic program granting a Baccalaureate Arts/Science Degree in Nursing and/or an RN prepared in a diploma program and subsequently granted a Baccalaureate Degree from an academic program.

Other: All other preparation such as Master of Arts/Science, Post-Baccalaureate preparation, Ph.D., etc.

RN's with no experience: An RN who has completed a preparation program, but has not practiced nursing. May be hired in an RN position awaiting State Board Examination results.

RN's with recent experience: An RN who has been active (practicing) in nursing and has recent nursing practice experience.

Returning RN: An RN who has been inactive (not practiced) in nursing for a number of years and is not considered experienced.

4. a. Of those RN's hired, how many did you hire of each of the following? *(Please note definitions on page 4. If you didn't hire any in a category, write "0". If your records don't include these breakdowns, please estimate. The total of these categories should be the same as the number given in Question 3a.)*

		Number Hired	
1.	ALL RN's with no experience	_____	*(15-17)*
NOTE: These should add up to the figure in 1.	• RN's with no experience, with AD	_____	*(18-20)*
	• RN's with no experience, with diploma	_____	*(21-23)*
	• RN's with no experience, with BA/BS	_____	*(24-26)*
	• Other RN's with no experience	_____	*(27-29)*
2.	ALL RN's with recent experience	_____	*(30-32)*
3.	ALL returning RN's	_____	*(33-35)*
	TOTAL	_____	

b. Are these figures entirely from your records, partly from your records and partly estimated, or solely an estimate? *(Please check one.)*

__ 1. Records only __ 2. Both records/estimate

__ 3. Estimate only *(36)*

HOW TO CALCULATE AVERAGE HOURLY SALARY FOR QUESTION 6a

a. *If you have weekly salary figures: 1) add the salaries of all RN's hired that year in the category; 2) divide the total by the number of hours in your full-time work week given in Question 5; 3) divide that number by the number of nurses hired that year in the category.*

b. *If you have monthly salary figures: 1) same as in (a-1) above; 2) divide the total by 4.3; 3) same as in (a-2) above; 4) same as in (a-3) above.*

c. *If you have yearly salary figures: 1) same as in (a-1) above; 2) divide the total by 52; 3) same as in (a-2) above; 4) same as in (a-3) above.*

IF YOU MUST ESTIMATE SALARY FIGURES IN QUESTION 6a:

a. *RN's with no experience: give the starting salary, at step 1, for that year.*

b. *RN's with recent experience: give the salary level which is in the middle of the salary range for that year. For example, if you hired experienced RN's that year from $8,500 to $10,500 you would use $9,500.*

c. *Returning RN's: give the starting salary, at step 1, for that year.*

5. Is your work week a 40-hour work week, a 35.5 work week, or what? *(Please write in the hours)* _____ *(37-39)*

6. a. What was the average hourly salary at which those RN's listed in Question 4a was hired? *(The way to calculate average hourly salary is given on page 6. If no RN's were hired in a category please write "0". If your records don't include these breakdowns, please estimate.)*

	Average Hourly Salary	
1. ALL RN's with no experience	_____	*(40-43)*
• RN's with no experience, with AD	_____	*(44-47)*
• RN's with no experience, with diploma	_____	*(48-51)*
• RN's with no experience, with BA/BS	_____	*(52-55)*
• Other RN's with no experience	_____	*(56-59)*
2. ALL RN's with recent experience	_____	*(60-63)*
3. ALL returning RN's	_____	*(64-67)*

b. Are these figures entirely from your records, partly from your records, and partly estimated, or solely an estimate? *(Please check one.)*

__ 1. Records only __ 2. Both records/estimate

__ 3. Estimate only *(68)*

NOTE: IF YOU INDICATED IN QUESTION 2 THAT YOU HAVE NO FORMAL ORIENTATION PROGRAM, SKIP TO QUESTION 11

DEFINITIONS AND INSTRUCTIONS FOR QUESTION 7

General Hospital Orientation:

Content of program includes (but is not limited to) overall hospital information such as:

a) Hospital-wide personnel practice (fringe benefits, payroll information, etc.).

b) Fire and safety policy and procedures.

c) Hospital organization and philosophy.

d) Hospital structure and tour.

Note: Include these even if these programs are not conducted by members of the nursing service department.

Nursing Service Orientation:

Content includes (but is not limited to) overall nursing service information such as:

a) Nursing service practice and policy for personnel assignment (shift rotation, weekend rotation, clinical unit rotation, dress code, etc.).

b) Philosophy, objectives, structure of nursing service.

c) Overall medication policy and procedure.

d) General charting procedures.

Clinical Unit Orientation:

Content includes (but is not limited to) clinical unit information such as:

a) Tour of unit.

b) Specialized unit policy and procedures.

7. Orientation, from our experience, tends to be divided into two parts: a formal orientation, consisting of General Hospital Orientation and Nursing Service Orientation, and the more informal Clinical Unit Orientation *(note definitions on page 8)*. Thinking now just of the formal part of orientation, how long is it, in hours?

_____ hours *(69-70)*

8. a. Now, considering the less formal Clinical Unit Orientation, in the year given in Question 1 and from our experience and from the pretest of this questionnaire, we note that the length of clinical unit orientation for an RN may vary according to previous experience and the type of training she has received. Please give the average number of hours of Clinical Unit Orientation that a typical RN in each of these groups received in that year. *(The average is obtained by totaling RN hours and dividing by the number of RN's. If your records don't give these figures, please estimate.)*

1 *(80)*

_____ *(1-5)*

	Average hours of Clinical Unit Orientation	
RN's with no experience, with AD	_____	*(6-8)*
RN's with no experience, with diploma	_____	*(9-11)*
RN's with no experience, with BA/BS	_____	*(12-14)*
Other RN's with no experience	_____	*(15-17)*
RN's with recent experience	_____	*(18-20)*
Returning RN's	_____	*(21-23)*

b. Are the averages entirely from your records, partly from your records and partly estimated, or solely an estimate? *(Please check one.)*

__ 1. Records only __ 2. Both records/estimate

__ 3. Estimate only *(24)*

DEFINITIONS AND INSTRUCTIONS FOR QUESTION 9a

Administration of Program: Includes (but is not limited to) such activities as:

a) Committee meetings.
b) Developing budgets.
c) Preparing yearly activity reports.
d) Purchasing equipment.
e) Selecting staff.

Preparation of Programs: Includes (but is not limited to) such activities as:

a) Development of curriculum and course content.
b) Arranging for teacher participation.
c) Developing audio-visual aides.
d) Arranging for space, equipment, etc.
e) Communication.

Teaching in Programs: Includes (but is not limited to) such activities as:

a) Direct conduct of the program for trainees.
b) Participation with other staff in training sessions.
c) Follow-up activity, monitoring trainees.

In-service Education Staff: Those staff who have primary and defined function for in-service education and staff development.

Director of Nurses:

Supervisors:

Clinical Coordinator:

Head Nurse:

Other:

-- Due to the diversity of responsibility and function of various levels and titles within the Departments of Nursing, some in-service activity may be carried out by other than identified in-service staff. Include any hours spent by these other staff, if they participate in teaching in these activities.

Include only those activities and programs taught at the hospital under the direction of the hospital staff.

9. a. Considering all orientation (General Hospital, Nursing Service, and Clinical Unit), how many hours of staff time were spent in a typical month, in the year given in Question 1, preparing, administering, and giving the orientation program? *(Add the hours spent in a typical month by each staff member in a category for the category total. If no staff in a category were involved, write "0" for that category. If your records don't include these breakdowns, please estimate the total hours, on the top line in hours, and estimate the time for all other categories either as a % of the total or in hours. The total of categories 1-6 should equal the total hours, or 100% if a % estimate is used. Note definitions on page 10.)*

	Total Staff hours in a typical month for orientation, including administration and preparation time	
• Total hours for all staff	_____	*(25-28)*
1. Total hours for In-service Education staff	_____	*(29-32)*
2. Total hours for Directors or Assistant Directors of Nursing	_____	*(33-36)*
3. Total hours for Supervisors	_____	*(37-40)*
4. Total hours for Clinical Coordinators/Practitioners	_____	*(41-44)*
5. Total hours for Head Nurses	_____	*(45-48)*
6. Total hours for all other staff participating in this orientation	_____	*(49-52)*

b. Are these figures entirely from your records, partly from your records and partly estimated, or solely an estimate? *(Please check one.)*

__ 1. Records only __ 2. Both records/estimate

__ 3. Estimate only *(53)*

HOW TO CALCULATE HOURLY SALARY FOR QUESTION 10a

a. *If you have weekly salary figures: 1) add the salaries of all staff in the category; 2) divide the total by the number of hours in your full-time work week given in Question 5; 3) divide the number by the number of staff in that category.*

b. *If you have monthly salary figures: 1) same as in (a-1) above; 2) divide the total by 4.3; 3) same as in (a-2) above; 4) same as in (a-3) above.*

c. *If you have yearly salary figures: 1) same as in (a-1) above; 2) divide the total by 52; 3) same as in (a-2) above; 4) same as in (a-3) above.*

HOSP. ID NO. _____ 12

97

10. a. So that we may calculate the costs of these orientation activities, please give below the average hourly salary for each staff category below. *(If no staff are in the category, or if no staff in the category participated in any of the three orientation activities, write "0". If your records don't give these breakdowns, please estimate. Please note instructions for obtaining the average hourly salary.)*

	Average Hourly Salary	
In-service Education staff	_____	*(54-57)*
Director of Nurses	_____	*(58-61)*
Supervisors	_____	*(62-65)*
Clinical Coordinators/Practitioners	_____	*(66-69)*
Head Nurses	_____	*(70-73)*
Other staff participating	_____	*(74-76)*

b. Are these figures entirely from your records, partly from your records and partly estimated, or solely an estimate? *(Please check one.)*

__ 1. Records only __ 2. Both records/estimate

__ 3. Estimate only *(77)*

DEFINITIONS FOR QUESTION 11

Identifiable Program: Refers to a program which is pre-planned, where the direction of the program is assigned, and which is recognized by the staff as a specified program.

In-service Program: Refers to program of information given to provide all RN's with information to support their knowledge, technical skills and professional growth during time they are employed at your institution. (excluding orientation)

In-service Education: All education programs and activities for RN's except those identified as orientation. May include items such as: basic skills, advanced skills/new techniques, management skills, and continuing education.

HOW TO CALCULATE AVERAGE HOURLY SALARY IN QUESTION 12a

a. *If you have weekly salary figures: 1) add the salaries of all staff in the category; 2) divide the total by the number of hours in your full-time work week given in Question 5; 3) divide that number by the number of staff in that category.*

b. *If you have monthly salary figures: 1) same as in (a-1) above; 2) divide the total by 4.3; 3) same as in (a-2) above; 4) same as in (a-3) above.*

c. *If you have yearly salary figures: 1) same as in (a-1) above; 2) divide the total by 52; 3) same as in (a-2) above; 4) same as in (a-3) above.*

IF YOU MUST ESTIMATE SALARY FIGURES IN 12a

Give the salary level which is in the middle of the salary range in that category for that year. For example, if staff nurses were earning between $8,500 and $10,500, you would use $9,500.

IN-SERVICE

11. Does this hospital have an identifiable in-service program for RN's? *(Please note definitions on page 14 and check one.)*

___ 1. Yes ___ 2. No *(78)*

2 *(80)*

_____ *(1-5)*

12. a. How many RN's, including both part time and full time did you have in your hospital at the end of the year given in Question 1 in each of the following categories, and what was the average hourly salary for each category? *(Note this includes those hired during the year. If you don't have the figures, please estimate. See page 14 for how to calculate average hourly salary.)*

	Number of RN's	Average Hourly Salary
No. of staff nurses	_____ *(6-8)*	_____ *(9-12)*
No. of Assistant Head Nurses and Head Nurses	_____ *(13-15)*	_____ *(16-19)*
No. of Assistant Supervisors and Supervisors	_____ *(20-22)*	_____ *(23-26)*
No. of Assistant Directors and Directors of Nursing	_____ *(27-29)*	_____ *(30-33)*
No. of other RN's	_____ *(34-36)*	_____ *(37-40)*
TOTAL RN's in Hospital:	_____ *(41-44)*	

b. Are these figures entirely from your records, partly from your records and partly estimated, or solely an estimate? *(Please check one.)*

__ 1. Records only __ 2. Both records/estimate

__ 3. Estimate only *(45)*

DEFINITIONS AND INSTRUCTIONS FOR QUESTION 16a

Administration of Program: — *Includes (but is not limited to) such activities as:*

a) Committee meetings.
b) Developing budgets.
c) Preparing yearly activity reports.
d) Purchasing equipment.
e) Selecting staff

Preparation of Program: — *Includes (but is not limited to) such activities as:*

a) Development of curriculum and course content.
b) Arranging for teacher participation.
c) Developing audio-visual aides.
d) Arranging for space, equipment, etc.
e) Communication.

Conducting Presentations: — *a) Direct conduct of the program.*
b) Participation with other staff in program.
c) Follow-up activity.

In-service Education Staff: — *Those staff who have primary and defined function for in-service education and staff development.*

Director of Nurses:
Supervisors:
Clinical Coordinator:
Head Nurse:
Other:

Due to the diversity of responsibility and function of various levels and titles within the Departments of Nursing, some in-service activity may be carried out by other than identified in-service staff. Include any hours spent by these other staff, if they participate in teaching in these activities.

Include only those activities and programs taught at the hospital under the direction of the hospital staff.

13. Concerning your in-service program in the year given in Question 1, about how many presentations were made that year?

Number of presentations _____ (46-47)

14. A typical in-service presentation was about how long? _____hours (48-49)

15. About how many RN's attended a typical in-service presentation? _____ (50-52)

3 (80)

_____ (1-5)

16. a. Considering all in-service (including administration, preparation, and conducting presentations), how many hours of staff time were spent <u>in a typical month</u>? *(Add the hours spent in a typical month by each staff member in a category for the category total. If no staff in a category were involved, write "0" for that category. If your records don't include these breakdowns, please estimate the <u>total hours</u>, on the top line in hours, and estimate the time for all other categories either as a % of the total or in hours. The total of categories 1-6 should equal the total hours, or 100% if a % estimate is used. Note definitions on page 16.)*

	Total staff hours <u>in a typical month</u> for in-service, including administration and <u>preparation time</u>	
• Total hours for <u>all</u> staff	_____	(6-9)
1. Total hours for In-service Education staff	_____	(10-13)
2. Total hours for Directors or Assistant Directors of Nursing	_____	(14-17)
3. Total hours for Supervisors	_____	(18-21)
4. Total hours for Clinical Coordinators/Supervisors	_____	(22-25)
5. Total hours for Head Nurses	_____	(26-29)
6. Total hours for all other staff participating in this orientation	_____	(30-33)

b. Are these figures entirely from your records, partly from your records and partly estimated, or solely an estimate?

__ 1. Records only __ 2. Both records/estimate __ 3. Estimate only (34)

HOSP. ID NO._____

DEFINITIONS FOR QUESTION 17

Qualified person: *1) An RN who has been prepared at the Baccalaureate or diploma level who has had experience in teaching in the clinical area or 2) who has been prepared at the Masters level in a clinical specialty area and/or Inservice Education.*

111

HOSP. ID NO. _____ 18

17. If the person in charge of your in-service education were to leave your hospital, which of the statements below best expresses your ability to replace him/her with a qualified person?
(Please note definitions on page 18 and check one.)

(35)

Would be easy to replace; the position would be filled immediately. _____ 1.

Would be somewhat difficult to replace; the position would be vacant for 2-3 months. _____ 2.

Would be very difficult to replace; the position would be vacant for over 3 months. _____ 3.

NOTE: IF YOU INDICATED IN QUESTION 2 THAT YOU HAD AN IDENTIFIABLE ORIENTATION PROGRAM, PLEASE SKIP TO QUESTION 19.

18. Please describe below any <u>informal</u> orientation activities for RN's joining your hospital.

_____

_____

_____

_____

_____

NOTE: IF YOU INDICATED IN QUESTION 11 THAT YOU HAD AN IDENTIFIABLE IN-SERVICE PROGRAM, PLEASE SKIP TO QUESTION 20.

19. Please describe below any informal in-service activities available for RN's.

_____

_____

_____

_____

_____

20. Please note below any comments you wish to make about orientation, in-service, or this questionnaire.

_____

_____

_____

_____

_____

DEFINITIONS AND INSTRUCTIONS FOR QUESTIONS 21-29

1. Cost report information format follows that of Schedule B-1 (Standard Medicare Report) and AHA Chart of Accounts.

2. All information should be rounded to nearest dollar.

3. Costs allocated to nursing education generally include School of Nursing, LPN Program, etc.

Include

NURSING DIVISION EXPENSE

Nursing expenses are recorded in the "600" series of accounts.

600 Nursing Division--Administrative Office

Account 600 should be charged with all expenses associated with the administrative office of the Director of Nursing. Appropriate sub-accounts should be established to accumulate the expenses of this center in a natural classification--salaries and wages, supplies, and so on.

601 Nursing Service--Administrative Office

This account should be charged with all expenses involved in the administration of personnel engaged in the provision of daily bedside care to patients and other nursing services relating to operating and recovery rooms, deliver and labor rooms, emergency rooms, and other functions organized under the Nursing Division, excluding Nursing Education.

Do Not Include

690 Nursing Education--Administrative Office

This account should be used to record a-l expenses associated with maintaining the administrative office of the Director of Nursing Education.

691 Diploma School of Nursing

This account should be used to record the direct expenses incurred in operating a diploma school of nursing. Such expenses would include the salaries of instructors, the school librarian, the director of welfare and social activities, and other personnel; they would also include fees paid to lecturers for special courses, allowances or stipends paid to student nurses, office and classroom supplies, library books and magazines, and student expenses.

692 Licensed Practical Nurse Program

This account should be used to record the direct expenses incurred in conducting a licensed practical nurse program in the hospital.

NOTE: YOU MAY WISH TO GIVE QUESTIONS 21-29 TO YOUR ADMINISTRATOR OR FISCAL OFFICER TO FILL OUT. SEE PAGE 22 FOR DEFINITIONS AND INSTRUCTIONS.

21. What were the total salary costs for nursing service reported for cost center 600 (exclude nursing education 690) for the year noted in Question 1?

$ _____ *(37-44)*

22. What were the total salary costs for nursing administration reported for cost center 601 (exclude that cost allocated to nursing education 690) in that year?

$ _____ *(45-50)*

23. What were the total salary costs for In-service Department, if identified separately? *(If not identified, please write NA)*

$ _____ *(51-55)*

24. What were the total direct costs of supplies expensed against 601 in that year? *(If not identified separately, please write NA)*

$ _____ *(56-61)*

25. What were the total direct costs of supplies expensed against the In-service Department, if identified separately? *(If not identified separately, please write NA)*

$ _____ *(62-66)*

26. What were the total <u>indirect</u> costs allocated to the In-service Department, if identified separately? *(If not identified, separately, please write NA)*

$ _____ *(67-71)*

4
(80)

(1-5)

27. What percentage of all revenue in that year was from the following sources?

		Percentage	
a.	Blue Cross	_____%	*(6-7)*
b.	Other private insurers	_____%	*(8-9)*
c.	Medicare	_____%	*(10-11)*
d.	Medicaid	_____%	*(12-13)*
e.	Other *(please specify source)*	_____%	*(14-15)*

_____

_____

28. What was the total number of patient bed days in that year?

_____ *(16-21)*

29. What was the total number of discharges (or admissions) for that year?

_____ *(22-26)*

5
(80)

Thank you for filling in this questionnaire. Please enclose it in the envelope provided and return to: *Suzanne Kase, RN*

15F Acorn Park
Cambridge, Massachusetts 02140

If you have any questions, please call collect: (617) 864-5770, ext. 3331.

2. REVISED QUESTIONNAIRE AND COVER LETTER (Sent either to the Director of Nursing or to another person, such as the Training Director, to whom we were referred by the Director of Nursing; copies to the Director of Nursing and the Administrator)

In November of 1974, we mailed to selected hospitals throughout the country questionnaires designed to help in identifying costs of orientation programs and inservice training for Registered Nurses.

As we pointed out in our recent telephone conversation, we are particularly interested in the data which can be supplied by your hospital. Because the original questionnaire contained several elements which did not need to be analyzed, we have restructured the form to contain only those items on which the analyses and projections are to be made.

It is not necessary for you to do any computations (we have a big machine). We can convert weekly, monthly or yearly salaries easily as long as they are labelled. We are aware that some hospitals do not keep records pertaining to hours devoted to orientation and inservice activities, so estimates for these hours are usable (and usually quite accurate).

We sincerely believe this format will be easy to use and, in addition, our telephone conversation will have helped identify your records in which can be found the data we are seeking. Please note that we have sent two copies of the questionnaire - one is for you to keep.

One of our team will call you in about a week in order to explain any items which may not be clear. (Or you may call me [collect] at 617-864-5770, extension 3366.)

My sincerest appreciation for your help,

Betty Swenson

Betty Swenson
Health Care Consultant

BS:rb
Enclosure

OMB Clearance Number 68-S73052
Contract Number NO1 NU 34082

INTRODUCTION TO QUESTIONNAIRE

These questions have been designed to elicit data in order to calculate and project to a national estimate (the first ever attempted) the costs of orientation and inservice education activities.

Please be assured that identification of costs with specific hospitals cannot be made by other than the project team; under the terms of our contract all identifying material is to be destroyed once the project is complete.

The four sections to this questionnaire and suggested possible sources of information are:

I. Descriptors of Hospital

- Report to American Hospital Association (annual submission)
- Personnel Department records
- Payroll Department records
- Your best estimate

II. Orientation Costs for Newly Hired RN's

- Nursing Office records
- Personnel Department records
- Staff Development Department records
- Payroll records
- Staffing tables
- Your best estimate

III. Parameters of Inservice Programs

- Inservice or Staff Development Department records
- Estimates of appropriate personnel and administration

IV. Costs for Preparation of Orientation and Inservice

- Inservice or Staff Development Department records
- Personnel Department records
- Your best estimate

These hours will include time spent by nurses in researching presentations, developing programs, working individually with Staff Nurses, informal teaching activities primarily intended for nurses, but optionally including other hospital personnel.

CODE _____

DESCRIPTORS OF HOSPITAL

1. Please use the most recent year for which you have end of fiscal year data when answering each of the questions below. Write here the year you will be using for all answers: 19____

2. What was the total number of patient bed days in that year? *(AHA Report)*

_____

3. What was the total number of discharges (or admissions) for that year? *(AHA Report)*

_____

4. Number of beds? *(AHA Report)* _____

5. a. TOTAL REGISTERED NURSES employed by hospital. Do not leave out any RN on payroll at whatever date is chosen to report.

CATEGORY	Full-Time	Part-Time	Ave. Sal.	Hr/Wk/Mo/Yr
No. of staff nurses				
No. of Assistant Head Nurses and Head Nurses				
No. of Assistant Supervisors and Supervisors				
No. of Assistant Directors and Directors of Nursing				
No. of Inservice RN's				
No. of Clinical Coordinators/Practitioners				
TOTAL RN's in hospital			XXXX	XXXX

b. Are the averages entirely from your records, partly from your records and partly estimated, or solely an estimate? *(Please check one.)*

__ 1. Records only __ 2. Both records/estimate

__ 3. Estimate only

CODE _____

ORIENTATION COSTS FOR NEWLY HIRED REGISTERED NURSES *(Salary Costs for Orientees)*

6. Does your hospital have an identifiable program for orientation of new personnel to the Hospital?

____ yes ____ no

7. How many hours of formal orientation are provided each new RN?

_____

8. a. Profile of RN's hired during year and hours of Clinical Unit Orientation.

	# Hired During Year		Usual Starting Salary	Hr/Wk Mo/Yr	Average Hours Clinical Unit Orientation
	FT	PT			
RN's with no experience, with AD					
RN's with no experience, with diploma					
RN's with no experience, with BA/BS					
Other RN's with no experience					
RN's with recent experience					
Returning RN's					
TOTALS			XXXX	XXXX	XXXX

b. Are the averages entirely from your records, partly from your records and partly estimated, or solely an estimate? *(Please check one.)*

__ 1. Records only __ 2. Both records/estimate

__ 3. Estimate only

Comments or Explanations *(optional)*: _____

_____

_____

_____

_____

_____

CODE _____

PARAMETERS OF INSERVICE PROGRAMS *(To Determine Salary Costs of Recipients)*

9. Does your hospital have an identifiable Inservice Program for RN's?

_____ yes _____ no

10. For the year given in Question 1, about how many presentations were made during the year?

_____ Number of presentations

11. A typical inservice presentation was about how long?

_____ Hours

12. About how many RN's attended a typical inservice presentation? *(Estimate average per session.)*

_____

(For questions 10, 11, and 12. Please check one.) Are the averages entirely from your records, partly from your records and partly estimated, or solely an estimate?

__ 1. Records only __ 2. Both records/estimate

__ 3. Estimate only

Description of Programs or Other Comments *(optional)*: _____

_____

_____

_____

_____

_____

CODE _____

ORIENTATION AND INSERVICE PREPARATION AND ADMINISTRATION

13. a. Hours per month of Nursing Staff time devoted to PREPARATION, ADMINISTRATION and CONDUCT of all orientation and inservice activities.

(DO NOT include hours for new nurse orientees or for personnel ATTENDING inservice programs, you have already given the data from which those calculations will be made.)

	Hours for ORIENTATION	Hours for INSERVICE
Inservice Education Staff		
Director of Nurses		
Supervisors		
Clinical Coordinators/ Practitioners		
Head Nurses		
Staff Nurses		
TOTAL OF HOURS		

b. Are the averages entirely from your records, partly from your records and partly estimated, or solely an estimate? *(Please check one.)*

__ 1. Records only __ 2. Both records/estimate

__ 3. Estimate only

Comments or Explanations *(optional)*: _____

_____

_____

_____

_____

_____

APPENDIX C

STATISTICAL ANALYSIS AND RESULTS

APPENDIX C

STATISTICAL ANALYSIS AND RESULTS

1. TOTAL IN-HOSPITAL EDUCATION COSTS PER SAMPLE HOSPITAL[1]

a. Cost of Orientation (C_o)

The cost of orientation for each respondent hospital is composed of:[2]

- Trainee salary costs

  Where C_{o_1} = cost due to orientee time spent in formal orientation

  and

  C_{o_2} = cost due to orientee time spent in informal orientation.

- Training staff costs

  Where C_{o_3} = cost due to training staff time for all orientation.

$$C_o = C_{o_1} + C_{o_2} + C_{o_3}$$

---

[1] All costs calculated in terms of yearly figures.

[2] Note that the questionnaire made a distinction between formal and informal orientation time in the case of orientees, but took training staff orientation time as a whole.

(1) Cost Due to Orientee Hours Spent in Formal Orientation (C_{o_1})

The following variables were defined (question numbers throughout refer to survey questionnaire):

Description	Variable	Columns	Question Number
Total number of orientees, no experience	$N_{No\ ex}$	15-17	4a
Number of orientees, no experience, with associate degree	n_{AD}	18-20	
Number of orientees, no experience, with diploma	n_{dip}	21-23	
Number of orientees, no experience, with BA/BS	$n_{BA/BS}$	24-26	
Number of orientees, no experience, with other training	n_{other}	27-29	
Number of orientees, recent experience	N_{Rec}	30-32	
Number of orientees, returning	N_{Ret}	33-35	
Average hourly salary, all orientees with no experience	$S_{No\ ex}$	40-43	6a
Average hourly salary, orientees with no experience, associate degree	s_{AD}	44-47	
Average hourly salary, orientees with no experience, diploma	s_{dip}	48-51	
Average hourly salary, orientees with no experience, BA/BS	$s_{BA/BS}$	52-55	
Average hourly salary, orientees with no experience, other training	s_{other}	56-59	
Average hourly salary, orientees with recent experience	S_{Rec}	60-63	
Average hourly salary, orientees returning	S_{Ret}	64-67	
Number of hours spent in formal orientation by each orientee	H_f	69-70	7

Cost due to orientee hours spent in formal orientation = C_{o_1} =

$$(n_{AD}s_{AD}H_f) + (n_{dip}s_{dip}H_f) + (n_{BA/BS}s_{BA/BS}H_f) + (n_{other}s_{other}H_f) +$$

$$(N_{Rec}S_{Rec}H_f) + (N_{Ret}S_{Ret}H_f)$$

(2) Cost Due to Orientee Hours Spent in Informal Orientation (C_{o_2})

The number of orientees and average hourly salary remain the same as for cost of formal orientation. Numbers of hours of informal orientation, however, were specified in the questionnaire by educational background and experience level:

Description	Variable	Columns	Question Number
Number of hours spent in informal orientation by orientees, no experience, with associate degree	H_{AD}	6-8	8a
Number of hours spent in informal orientation by orientees, no experience, with diploma	H_{dip}	9-11	
Number of hours spent in informal orientation by orientees, no experience, with BA/BS	$H_{BA/BS}$	12-14	
Number of hours spent in informal orientation by orientees, no experience, with other training	H_{other}	15-17	
Number of hours spent in informal orientation by orientees with recent experience	H_{Rec}	18-20	
Number of hours spent in informal orientation by orientees returning	H_{Ret}	21-23	

Cost due to orientee hours spent in informal orientation = C_{o_2}

$$(n_{AD}s_{AD}H_{AD}) + (n_{dip}s_{dip}H_{dip}) + (n_{BA/BS}s_{BA/BS}H_{BA/BS}) + (n_{oth}s_{oth}H_{oth}) +$$

$$(N_{Rec}S_{Rec}H_{Rec}) + (N_{Ret}S_{Ret}H_{Ret})$$

(3) Cost of Training Staff Hours for Orientation (C_{o_3})

Training staff hours[1] were calculated differently from orientee hours, since the questionnaire asked for total hours of staff time per month. Thus, the total hours of staff time multiplied by 12 equal the total yearly number of staff hours involved in orientation. Variables for hours and salaries were as follows:

Description	Variable	Columns	Question Number
Total hours per month for all training staff	H_{o_t}	25-28	9a0
Total hours per month for inservice education staff	H_{o_1}	29-32	9a1
Total hours per month for directors or assistant directors of nursing	H_{o_2}	33-36	9a2
Total hours per month for supervisors	H_{o_3}	37-40	9a3
Total hours per month for clinical coordinators/practitioners	H_{o_4}	41-44	9a4
Total hours per month for head nurses	H_{o_5}	45-48	9a5
Average hourly salary for inservice education staff	S_1	54-57	10a
Average hourly salary for director of nurses	S_2	58-61	
Average hourly salary for supervisors	S_3	62-65	
Average hourly salary for clinical coordinators/practitioners	S_4	66-69	
Average hourly salary for head nurses	S_5	70-73	

[1] The decision was made to omit "all other" staff participating in orientation (Q 9a6) because of incomplete information from respondents.

Total cost of training staff hours for orientation = C_{o_3} =

$$\frac{12(H_{o_1}S_1 + H_{o_2}S_2 + H_{o_3}S_3 + H_{o_4}S_4 + H_{o_5}S_5)}{}$$

(4) Total Orientee and Training Staff Costs for Orientation

Total annual cost of personnel involved in orientation (orientees plus staff), then, = (cost due to orientee time spent in formal orientation) + (cost due to orientee time spent in informal orientation) + (cost due to staff time for all orientation).

b. Cost of Inservice Education (C_I)

The total cost of inservice education consists of:

- C_{I_1} = cost of RN participation in inservice education
- C_{I_2} = cost of staff administering, preparing, and conducting presentations

$$C_I = C_{I_1} + C_{I_2}$$

(1) Cost of RN Participation in Inservice Education (C_{I_1})

Determination of the cost of RN participation in inservice education involves three operations:

- Calculating average hourly salary over all types of RNs participating in inservice education,
- Calculating total number of hours RNs spent in inservice education, and
- Multiplying salary by hours.

Variables used to calculate average hourly salary were:

Description	Variable	Columns	Question Number
Number of staff nurses	N_{s_1}	6-8	12a
Number of assistant head nurses and head nurses	N_{s_2}	13-15	

Description	Variable	Columns	Question Number
Number of assistant supervisors and supervisors	N_{s_3}	20-22	
Number of assistant directors and directors of nursing	N_{s_4}	27-29	
Number of other RNs	N_{s_5}	34-36	
Total RNs in hospital	N_{s_t}	41-44	
Average hourly salary, staff nurses	S_{s_1}	9-12	
Average hourly salary, assistant head nurses and head nurses	S_{s_2}	16-19	
Average hourly salary, assistant supervisors and supervisors	S_{s_3}	23-26	
Average hourly salary, assistant directors and directors of nursing	S_{s_4}	30-33	
Average hourly salary, other RNs	S_{s_5}	37-40	

$$\text{Average hourly salary (A)} = \frac{N_{s_1} S_{s_1} + N_{s_2} S_{s_2} + N_{s_3} S_{s_3} + N_{s_4} S_{s_4} + N_{s_5} S_{s_5}}{N_{s_t}}$$

Variables used to calculate total number of RN hours spent in inservice education were:

Description	Variable	Columns	Question Number
Number of presentations made in 1 year in inservice program	P	46-47	13

130

Description	Variable	Columns	Question Number
Length of typical inservice presentation	L	48-49	14
Number of RNs attending typical inservice presentation	Q	50-52	15

Total number of hours spent by RNs in inservice education (B) = PLQ.

The total cost of RN participation in inservice education = average hourly salary times total number of hours = A x B.

(2) Cost of Staff Administering, Preparing, and Conducting Inservice Training[1] (C_{I_2})

As in the case of orientation, training staff time for inservice was reported for a typical month. Multiplying this number by 12, then, gave total staff hours involved in inservice. Variables for hours and salaries were:

Description	Variable	Columns	Question Number
Total hours per month for all staff for inservice	H_{I_t}	6-9	16ao
Total hours per month for inservice education staff	H_{I_1}	10-13	16a1
Total hours per month for directors or assistant directors of nursing	H_{I_2}	14-17	16a2
Total hours per month for supervisors	H_{I_3}	18-21	16a3

[1] The decision was made to omit "all other" staff participating in inservice (16a6) because of incomplete information from respondents.

Description	Variable	Columns	Question Number
Total hours per month for clinical coordinators/supervisors	H_{I_4}	22-25	16a4
Total hours per month for head nurses	H_{I_5}	26-29	16a5
Average hourly salary for inservice education staff	S_1	54-57	10a
Average hourly salary for director of nurses	S_2	58-61	
Average hourly salary for supervisors	S_3	62-65	
Average hourly salary for clinical coordinators/practitioners	S_4	66-69	
Average hourly salary for head nurses	S_5	70-73	

The cost of staff administering, preparing, and conducting inservice training, then, =

$$12(H_{I_1} S_1 + H_{I_2} S_2 + H_{I_3} S_3 + H_{I_4} S_4 + H_{I_5} S_5)$$

Total annual cost of personnel involved in inservice education (trainees plus staff), then, = (cost of RN participation in inservice training) + (cost of staff administering, preparing, and conducting inservice training).

c. Total In-Hospital Education Costs

To determine total in-hospital education costs, add (total orientation cost) plus (total inservice education cost).

2. MEAN SAMPLE COSTS AND VARIANCES

a. Orientation

MEANS

Region	0-99 Beds	100-199	200-299	300-399	400-499	500 and Over	Means
I	$ 4,682	$31,226	$45,556	$43,715	$47,834	$118,273	$50,339
II	150	18,036	39,755	45,252	70,445	146,794	$83,050
III	4,892	19,430	42,041	52,861	63,497	117,705	$65,162
IV	4,461	20,897	43,389	56,685	71,254	151,542	$83,286
V	12,665	20,134	25,551[1]	87,859	49,718	100,658	$52,590
VI	6,074	14,850	20,524	53,233	55,744	94,143	$48,057
VII	532	24,135	30,980	54,400	53,103	116,013	$60,738
VIII	8,857	23,229	42,407	40,185	40,778	126,425	$38,770
IX	11,652	32,883	29,911	40,540	94,799	87,165	$44,482
Means	$ 7,101	$22,751	$38,133	$50,292	$67,180	$130,370	$65,172

STANDARD DEVIATIONS OF SAMPLE DATA

Region	0-99 Beds	100-199	200-299	300-399	400-499	500 and Over
I	$ 640	$15,435	$45,376	$17,271	$ 346	$ 79,250
II	-[2]	21,441	28,575	23,817	42,892	114,852
III	-	12,860	20,501	28,713	40,530	58,085
IV	3,959	10,173	27,903	25,663	43,736	127,585
V	15,732	7,885	-	10,820	6,431	80,446
VI	6,090	14,560	10,887	48,451	17,226	52,383
VII	632	17,973	19,279	29,578	-	102,294
VIII	3,171	6,504	26,242	20,107	-	-
IX	14,633	45,432	20,444	18,669	63,359	17,023

[1] Underlined means indicate no data available for cell; mean was estimated according to the following formula:

If $n_{ij} = 0$, estimated mean in cell $= \bar{c}i + \bar{c}j - \bar{\bar{c}}ij$

where:

n_{ij} = number of sample hospitals in i^{th} bed size class in j^{th} region,

$\bar{c}i$ = weighted column mean,

$\bar{c}j$ = weighted row mean, and

$\bar{\bar{c}}ij$ = weighted grand mean.

[2] Blank standard deviations indicate data not sufficient for standard deviation estimate; $n_{ij} = 0$ or 1.

b. Inservice

MEANS

Region	0-99 Beds	100-199	200-299	300-399	400-499	500 and Over	Means
I	$2,406	$19,712	$19,914	$34,474	$ 19,979	$ 61,338	$28,496
II	6,455	10,446	31,914	[illegible],341	18,582	116,133	$61,207
III	8,321	11,113	18,073	43,423	33,499	57,409	$36,813
IV	2,105	19,859	32,204	27,726	43,219	48,280	$35,009
V	7,509	11,049	10,548[1]	10,840	36,488	46,019	$22,794
VI	3,959	7,437	17,302	15,618	25,881	33,145	$18,828
VII	2,259	21,587	10,585	28,344	182,326	50,625	$35,676
VIII	5,748	10,605	19,269	27,002	25,315	19,591	$16,999
IX	6,639	29,562	37,046	37,861	139,159	68,241	$48,025
Means	$4,733	$16,619	$26,214	$31,523	$ 46,776	$ 68,556	$38,460

STANDARD DEVIATIONS OF SAMPLE DATA

Region	0-99 Beds	100-199	200-299	300-399	400-499	500 and Over
I	$ 1,319	$14,805	$10,440	$20,810	$17,304	$ 36,572
II	96,161	8,212	22,440	41,329	10,838	176,774
III	14,911	5,762	14,462	47,686	50,101	106,301
IV	1,729	4,064	25,599	27,354	37,256	40,607
V	7,998	8,452	-[2]	6,623	42,778	27,783
VI	5,386	5,187	8,448	14,119	12,407	29,389
VII	3,025	21,029	7,518	21,129	-	35,454
VIII	100	8,855	8,536	21,870	-	88,799
IX	6,251	25,579	18,500	31,733	74,001	67,668

---

[1]Underlined means indicate no data available for cell; mean was estimated according to the following formula:

If nij = 0, estimated mean in cell = $\bar{c}i + \bar{c}j - \bar{\bar{c}}ij$

where: nij = number of sample hospitals in i^{th} bed size class in j^{th} region,

$\bar{c}i$ = weighted column mean,

$\bar{c}j$ = weighted row mean, and

$\bar{\bar{c}}ij$ = weighted grand mean.

[2]Blank standard deviations indicate data not sufficient for standard deviation estimate; nij = 0 or 1.

c. Combined Orientation and Inservice

MEANS

Region	0-99 Beds	100-199	200-299	300-399	400-499	500 and Over	Means
I	$ 7,089	$50,938	$65,470	$78,188	$ 67,813	$179,611	$ 78,835
II	6,605	28,482	71,669	80,592	89,027	262,927	$114,256
III	13,213	30,543	60,115	96,284	96,996	175,114	$101,976
IV	6,566	40,756	75,593	84,411	114,473	199,822	$118,295
V	20,174	31,183	36,099[1]	98,699	86,207	146,677	$ 75,384
VI	10,034	22,288	37,826	68,850	81,626	127,288	$ 66,884
VII	2,791	45,722	41,565	82,744	235,429	166,638	$ 96,413
VIII	14,605	33,834	61,675	67,187	66,091	146,016	$ 55,768
IX	18,291	62,446	66,957	78,400	233,958	155,406	$ 92,506
Means	$11,835	$39,370	$64,347	$81,815	$113,955	$198,926	$103,632

STANDARD DEVIATIONS OF SAMPLE DATA

Region	0-99 Beds	100-199	200-299	300-399	400-499	500 and Over
I	$ 1,960	$28,881	$51,731	$32,876	$16,979	$ 89,729
II	-[2]	25,001	43,165	45,869	50,048	262,328
III	-	11,182	28,231	63,113	70,600	114,044
IV	4,198	12,737	52,806	46,504	60,294	143,471
V	23,483	16,220	-	4,200	49,210	107,280
VI	11,259	18,447	8,195	60,536	23,626	62,861
VII	3,599	36,130	11,807	43,470	-	121,252
VIII	3,007	13,990	30,591	23,827	-	-
IX	20,465	69,038	32,005	45,980	78,666	74,889

[1] Underlined means indicate no data available for cell; mean was estimated according to the following formula:

If $n_{ij} = 0$, estimated mean in cell $= \bar{c}_i + \bar{c}_j - \bar{\bar{c}}_{ij}$

where: n_{ij} = number of sample hospitals in i^{th} bed size class in j^{th} region,

$\bar{c}_i$ = weighted column mean,

$\bar{c}_j$ = weighted row mean, and

$\bar{\bar{c}}_{ij}$ = weighted grand mean.

[2] Blank standard deviations indicate data not sufficient for standard deviation estimate; $n_{ij} = 0$ or 1.

3. PROJECTIONS ONTO THE TOTAL POPULATION OF HOSPITALS IN THE UNITED STATES

a. Method of Calculation

The total cost of orientation and inservice education for all hospitals in the United States was estimated by projection from the sample data.

Let: C_{ijk} represent cost of k^{th} hospital in i^{th} bed size group and j^{th} region (that is, in cell i,j of the size-by-region matrix). Then the estimate of the total "national" cost of orientation and inservice education is:

$$\hat{C}_T = \sum_i \sum_j N_{ij} \bar{C}_{ij}$$

where: $\hat{C}_T$ = estimate of total cost of orientation plus inservice education for all United States "community" hospitals

N_{ij} = population total in cell i,j

$\bar{C}_{ij}$ = mean cost of a hospital in i^{th} bed size group and j^{th} region

The variance of this estimate is:

$$\text{Variance } \hat{C}_T = \sum_i \sum_j \frac{N_{ij}^2}{n_{ij}} \text{ Variance } C_{ij}$$

where: n_{ij} = sample response in cell i,j

$$\text{Variance } C_{ij} = \sum_i \sum_j \frac{N_{ij}^2}{n_{ij}} s^2_{c_{ij}} \text{ and}$$

$s^2_{c_{ij}}$ = Variance of sample cost in cell i,j

The coefficient of variation of this estimate is:

$$CV = \frac{\sqrt{\text{Var } \hat{C}_T}}{\hat{C}_T}$$

and the 95% confidence limits = $\hat{C}_T \pm 1.96\sqrt{\text{Var } \hat{C}_T}$

where $\sqrt{\text{Var } \hat{C}_T}$ = standard deviation of cost estimate

The estimate of the mean cost of orientation plus inservice training for all community hospitals is:

$$\hat{\mu}_T = \frac{\sum_i \sum_j \left(N_{ij} \bar{C}_{ij} \right)}{N_{ij}}$$

$$\text{Variance of } \hat{\mu}_T = \frac{\sum_i \sum_j \frac{N_{ij}^2}{n_{ij}} s^2_{c_{ij}}}{N_{ij}^2}$$

$$\text{and CV} = \frac{\sqrt{\text{Var } \hat{\mu}_T}}{\hat{\mu}_T}$$

Total costs and mean costs for all hospitals were also estimated for orientation and inservice education separately.

b. Orientation Costs by Bed Size Group

TOTALS

	0-99 Beds	100-199	200-299	300-399	400-499	500 and Over
Estimated Total C_o	$19,081,700	$29,149,700	$23,210,300	$18,511,800	$12,896,600	$31,675,500
Standard Deviation C_o	$3,894,900	$3,759,800	$2,223,700	$1,168,400	$1,003,900	$2,372,400
Coefficient of Variation	20%	13%	10%	6%	8%	8%

MEANS

	0-99 Beds	100-199	200-299	300-399	400-499	500 and Over
Estimated Mean C_o	$5,970	$22,100	$37,618	$50,856	$65,134	$128,762
Standard Deviation Mean C_o	$1,479	$2,850	$3,801	$3,210	$5,672	$9,885
Coefficient of Variation	25%	13%	10%	6%	9%	8%

c. Orientation Costs by Region

TOTALS

Region	Estimated Total C_o	Standard Deviation C_o	Coefficient of Variation
I	$ 8,137,800	$1,089,600	13%
II	24,524,900	2,454,800	10
III	18,109,400	1,535,300	8
IV	29,957,600	2,468,500	8
V	9,445,600	2,411,300	26
VI	11,305,300	1,758,400	16
VII	9,307,500	1,360,000	15
VIII	6,207,500	697,000	11
IX	17,529,900	3,917,500	22

MEANS

Region	Estimated Mean C_o	Standard Deviation Mean C_o	Coefficient of Variation
I	$26,769	$3,584	13%
II	35,751	4,757	13
III	22,952	3,867	17
IV	31,601	2,604	8
V	20,445	5,608	27
VI	13,974	2,174	16
VII	11,309	1,679	15
VIII	17,101	1,997	12
IX	23,188	5,182	22

d. Inservice Costs by Bed Size Group

TOTALS

	0-99 Beds	100-199	200-299	300-399	400-499	500 and Over
Estimated Total C_I	$15,608,500	$21,426,500	$16,173,100	$11,446,000	$10,184,000	$16,371,000
Standard Deviation C_I	$1,030,600	$589,500	$369,400	$241,900	$170,600	$228,600
Coefficient of Variation	8%	3%	2%	2%	2%	1%

MEANS

	0-99 Beds	100-199	200-299	300-399	400-499	500 and Over
Estimated Mean C_I	$4,884	$16,244	$26,213	$31,445	$51,434	$66,549
Standard Deviation Mean C_I	$391	$447	$631	$665	$964	$953
Coefficient of Variation	8%	3%	2%	2%	2%	1%

e. Inservice Cost by Region

TOTALS

Region	Estimated Total C_I	Standard Deviation C_I	Coefficient of Variation
I	$ 4,574,500	$188,000	4%
II	18,475,700	352,400	2
III	12,286,800	301,500	2
IV	17,392,100	403,300	2
V	4,816,700	456,300	9
VI	5,711,400	549,300	10
VII	8,975,000	646,100	7
VIII	3,203,800	126,400	4
IX	15,773,000	574,200	4

MEANS

Region	Estimated Mean C_I	Standard Deviation Mean C_I	Coefficient of Variation
I	$15,048	$ 618	4%
II	26,932	683	3
III	15,573	759	5
IV	18,346	425	2
V	10,426	1,061	10
VI	7,060	679	10
VII	10,905	798	7
VIII	8,826	362	4
IX	20,864	759	4

f. Combined Orientation and Inservice Costs by Bed Size Group

TOTALS

	0-99 Beds	100-199	200-299	300-399	400-499	500 and Over
Estimated Total C_T	$34,690,800	$50,576,400	$39,383,500	$29,957,500	$23,080,568	$48,046,500
Standard Deviation C_T	$5,888,600	$5,524,100	$3,490,900	$2,080,800	$1,626,600	$3,979,200
Coefficient of Variation	17%	11%	9%	7%	7%	8%

MEANS

	0-99 Beds	100-199	200-299	300-399	400-499	500 and Over
Estimated Mean C_T	$10,854	$38,345	$63,831	$82,301	$116,569	$195,311
Standard Deviation Mean C_T	$2,236	$4,188	$5,967	$5,717	$9,190	$16,580
Coefficient of Variation	20%	11%	9%	7%	8%	8%

g. Combined Orientation and Inservice Costs by Region

TOTALS

Region	Estimated Total C_T	Standard Deviation C_T	Coefficient of Variation
I	$12,712,500	$1,489,900	12%
II	43,000,400	4,145,700	10
III	30,396,300	2,218,400	7
IV	47,349,700	3,565,300	8
V	14,262,200	3,682,200	26
VI	17,017,400	2,889,600	17
VII	18,282,500	2,593,800	14
VIII	9,411,300	819,900	9
IX	33,303,100	5,817,200	17

MEANS

Region	Estimated Mean C_T	Standard Deviation Mean C_T	Coefficient of Variation
I	$41,817	$4,901	12%
II	62,683	8,034	13
III	38,525	5,588	15
IV	49,947	3,761	8
V	30,871	8,563	28
VI	21,035	3,572	17
VII	22,214	3,202	14
VIII	25,926	2,349	9
IX	44,052	7,695	17

4. RESULTS OF NON-RESPONDENT FOLLOW-UP SURVEY

The operations described in Sections 1-3 above were repeated for a sample of 83 hospitals which did not respond to the original survey. The purpose of this analysis was to test for bias of nonresponse by comparing the resulting estimates. The tables below show mean per-hospital costs in the nonrespondent sample. They can be compared with the tables on pages C-11 through C-13.

Projections by size group and region have not been included because of small sample size. Projected totals across all size groups and regions are compared with our original projections on pages 30-32 of this report.

a. Orientation Costs by Bed Size Group and Region

MEAN SAMPLE COSTS PER HOSPITAL

Region	0-99 Beds	100-199	200-299	300-399	400-493	500 and Over
I	$ 2,228	$21,796	$14,884	$ 49,667	$101,050	$ 86,465
II	69,366	15,576	80,702	44,273	121,310	173,810
III	1,030	15,101*	39,317*	47,124	36,086	90,446
IV	7,203	13,139	71,914	107,070	22,715	53,804
V	13,100	4,393	14,260	37,452	51,105	52,946
VI	2,047	8,203	45,927	58,968	131,590	78,387*
VII	7,013	6,541	30,704	142,1[illegible]	27,992	130,600
VIII	10,221	10,425	16,380*	40,343	491	87,403
IX	36,616*	39,328*	5,490	85,503*	132,610	113,550*

* = Estimate

STANDARD DEVIATIONS OF SAMPLE DATA

Region	0-99 Beds	100-199	200-299	300-399	400-499	500 and Over
I	$166,922	$210,756	$ 99,451	-	-	$63,326
II	-[1]	299,227	469,178	270,324	223,761	-
III	-	-	-	192,535	-	-
IV	-	714,368	533,047	-	117,425	376,252
V	-	-	-	-	66,299	58,113
VI	592,818	88,846	211,026	-	-	-
VII	920,300	-	137,642	-	51,253	-
VIII	576,455	85,395	-	61,001	-	-
IX	-	-	68,584	-	23,527	-

[1] Blank standard deviations indicate data not sufficient for standard deviation estimate; nij = 0 or 1.

b. Inservice Costs by Bed Size Group and Region

MEAN SAMPLE COSTS PER HOSPITAL

Region	0-99 Beds	100-199	200-299	300-399	400-499	500 and Over
I	$ 2,442	$ 8,570	$36,343	$ 8,178	$ 3,024	$40,319
II	81,135	33,981	21,834	67,272	68,171	82,897
III	688	7,081	8,619	20,610	7,115	8,047
IV	883	4,405	17,189	17,267	5,679	37,129
V	8,668	7,874	4,469	25,170	15,333	20,473
VI	3,960	7,000	6,405	16,431	21,687	17,459
VII	2,377	9,487	5,640	56,988	9,137	715
VIII	2,804	26,076	8,396	21,690	865	6,262
IX	48,986	55,357	15,538	71,087	106,910	70,147

STANDARD DEVIATIONS OF SAMPLE DATA

Region	0-99 Beds	100-199	200-299	300-399	400-499	500 and Over
I	$ 716	$ 5,156	$16,843	$31,519	$25,853	$42,042
II	36,613	14,938	11,288	53,628	58,247	45,742
III	-[1]	-	-	10,019	19,253	23,192
IV	-	1,274	17,894	27,359	5,448	22,546
V	-	2,635	8,724	29,203	21,684	6,687
VI	6,603	4,387	391	24,940	17,231	21,543
VII	2,573	-	7,371	25,478	9,965	22,164
VIII	4,393	12,279	-	25,469	20,935	24,607
IX	-	-	14,636	28,265	13,891	25,319

[1] Blank standard deviations indicate data not sufficient for standard deviation estimate; nij = 0 or 1.

c. Combined Orientation and Inservice Costs by Bed Size Group and Region

MEAN SAMPLE COSTS PER HOSPITAL

Region	0-99 Beds	100-199	200-299	300-399	400-499	500 and Over
I	$ 4,669	$30,366	$ 51,226	$ 57,845	$104,080	$126,780
II	150,500	49,558	102,540	111,550	189,480	256,710
III	1,717	22,181	47,936	67,734	43,200	98,492
IV	8,085	17,544	89,103	124,330	28,394	90,932
V	21,768	12,267	18,729	62,622	66,438	73,419
VI	6,007	15,203	52,332	75,398	153,280	95,845
VII	9,390	16,028	36,344	199,080	37,129	131,320
VIII	13,024	36,502	24,776	62,033	1,355	93,664
IX	85,601	94,684	21,028	156,590	239,520	183,700

STANDARD DEVIATIONS OF SAMPLE DATA

Region	0-99 Beds	100-199	200-299	300-399	400-499	500 and Over
I	$ 3,866	$28,730	$16,051	$64,370	$ 63,717	$108,324
II	67,333	19,795	9,363	75,905	139,996	104,609
III	29,461	30,099	45,844	52,859	67,340	85,305
IV	-[1]	14,423	11,510	54,417	34,704	53,545
V	46,756	47,161	58,481	77,051	52,101	74,230
VI	10,001	3,494	50,881	50,246	49,405	71,994
VII	2,445	21,997	58,220	64,780	41,054	82,795
VIII	24,778	5,744	20,755	69,506	53,514	74,874
IX	-	-	15,223	44,892	10,888	68,365

[1] Blank standard deviations indicate data not sufficient for standard deviation estimate; nij = 0 or 1.

5. MULTIPLE REGRESSION ANALYSIS OF SAMPLE DATA

a. Introduction

Multiple regression analysis is a standard statistical technique for quantifying the effects of certain predictor, or independent, variables on a dependent variable. Coefficients are estimated in an equation of the general form:

$$y = a_o + a_1x_1 + a_2x_2 + \ldots + a_nx_n$$

where y is the dependent variable to be predicted, and x_1 through x_n are the predictor variables significantly affecting y. Some of the x's may be higher powers or cross-products of more fundamental variables; in this way, the model (equation) does not need to be linear.

Regression analysis also produces statistics which measure the "goodness of fit" of the equation to the data. The r^2 statistic indicates the percent of variability in the dependent variable "explained" by the regression equation. An F-value allows us to determine whether a specific variable is a significant contributor to the variability explained by the regression equation. The standard error of estimate gives an error range for values of the dependent variable predicted by the regression equation. In other words, it is a measure of the variability remaining in the dependent variable which is not explained by the predictor variables.

In this study three separate regression models were developed, predicting the following three dependent variables:

(1) Total orientation cost per patient day,

(2) Total inservice cost per patient day, and

(3) Orientation plus inservice cost per patient day.

b. Variables Used

It is important to note that by using cost per patient day as a cost index, we attempted to eliminate variability due to hospital size. An initial regression analysis, in which the three dependent variables were total cost of orientation, total cost of inservice education, and total combined costs, showed that the overwhelming effect on costs was due to hospital size. The two variables which reflect hospital size, number of new nurses and number of patient days, were highly correlated with each other and with costs. Since effects due to hospital size overshadowed possible effects of other variables, we conducted further analysis using costs <u>per patient day</u> as the dependent variable.

This enabled us to look at variability at a more refined level, given that the greatest effect on cost of orientation, cost of inservice education, and combined costs is due to size of hospital.

The data were analyzed utilizing the BMD2R Stepwise Regression Program. Output produced included:

(1) Means and standard deviation,

(2) Correlation matrix, and

(3) List of residuals.

After a preliminary screening to eliminate factors showing no relationship to costs per patient day, 66 variables and cross-products were tested further. These are listed at the end of this appendix. Sixteen of the variables were found to significantly affect per patient day costs of orientation, inservice, or both. These are:

(1) Number of new nurses (x_1)[1],

(2) New-nurse workload ratio of patient days to nurse days (x_2),

(3) Percent hospital utilization, or 100 x patient days/beds x 365 (x_3),

(4) Percentage of newly hired nurses with no experience who have diplomas (x_4),

(5) Local government control index, either 1 or 0 for yes or no (x_5),

(6) Region VI index, either 1 or 0 for yes or no (x_6)

(7) New nurses as a percent of all RNs[1] (x_7),

(8) Interaction between number of new nurses and new nurse workload (x_1x_2), and

(9) Interaction between hospital utilization and new-nurse workload (x_2x_3),

---

[1]Total RNs were estimated conservatively by counting each reported full-time equivalent as one RN

(10) Interaction between hospital utilization and percent new nurses with no experience who have a diploma (x_3x_4),

(11) Interaction between new nurse workload and new nurses as a percent of all RNs (x_2x_7),

(12) Interaction between hospital utilization and local government control (x_3x_5),

(13) Interaction between hospital utilization and new nurses as a percent of all RNs (x_3x_7),

(14) Interaction between local government control and Region VI (x_5x_6),

(15) Interaction between new nurse workload and percent of new nurses with no experience who have a diploma, and

(16) Interaction between new nurse workload and local government control (x_2x_5).

c. Orientation

The following equation, relating hospital parameters and new nurse experience and educational levels to *orientation costs* per patient day, resulted from the regression analysis:

$$y_1 = .101 + .0018x_1 + .0244x_2 + 1.1495x_3 - .1102x_5 - .0003x_1x_2$$

$$+ .0015x_1x_5 - .0633x_2x_3 - .518x^2_3 - .002x_3x_4$$

where y_1 = orientation cost per patient day. The r^2 value for this equation was .18; that is, 18% of the variability in cost per patient day is explained by this formula. The standard error of the orientation costs per hospital estimated by this formula is $0.40 per patient day.

In order to demonstrate the rather complex interrelationship of these variables, it is helpful to take as an example a hypothetical hospital with 80 new nurses, a new nurse workload of 6 (patient days per new nurse day), 75% hospital utilization, 30% new nurses with no experience with diploma, and under local government control. (X_5 = 1: would be zero if not under government control). Then, cost of orientation per patient day for the hypothetical hospital is:

$y_1 = .101 + .144 + .1464 + .8621 - .1102 - .144 + .12 - .2849 - .2914 -$

$.0005 = \$.54$

d. Inservice Education

The analysis for *inservice education costs* per patient day produced the following regression equation:

$$y_2 = .752 + .1483x_3 - .0026x_4 - .192x_6 - .517x_7 - .0283x_2x_3 - .514x_3^2$$

$$+ .0966x_2x_7 + .027x_3x_5 + .015x_3x_7 + .223x_5x_6 + .00024x_2x_4$$

where y_2 = inservice cost per patient day. The r^2 for this equation is .16; the standard error $0.34.

Let us take the same hospital as an example. Assume that it is not in Region VI and that it has 40% new nurses with no experience. Then the cost of inservice training per patient day for that hospital will be:

$$y_2 = .752 + .111225 - .00078 - 0 - .2068 - .12735 - .289125 + .23184$$

$$+ .02025 + .0045 + 0 + .000432 = \$.50$$

e. Orientation and Inservice Education Combined

The following equation resulted from the analysis of *orientation and inservice costs combined*, per patient day:

$$y_3 = .4729 + .1047x_2 + .9596x_3 - .00319x_4 + .3518x_5 - .255x_6 -$$

$$.1833x_2x_3 - .0672x_2x_5 + .00094x_3x_7$$

where y_3 = combined orientation and inservice cost per patient day. The r^2 is .17; the standard error is $.60.

The cost per patient day for the hypothetical hospital for orientation plus inservice would be:

$$y_3 = .4729 + .6282 + .7197 - .000957 + .3518 - 0 - .82485 - .4032$$

$$+ .000282 = \$.94$$

f. Magnitude of Effects

In comparison to the effect of hospital size, the effects of these other variable are small. This is evidenced by the difference in the r^2 statistics associated with the regressions based on total costs and on costs per patient day. For example, in the regression using total cost of orientation as the dependent variable, the r^2 statistic was a high .66, whereas the regression for cost of orientation per patient day

had an r^2 of .18. The regression models do, however, give an indication of which variables effect costs in hospitals of the same size.

The relatively high standard errors for these three regression equations (.40, .34, and .60 for orientation, inservice, and combined, respectively) reflect the variability within the data. Thus any prediction of cost based on the three equations may well be "off" by as much as plus or minus $.60.

g. Summary Table and List of Independent Variables

The summary table on the next page shows the steps in the regression analysis, and the r^2 values and F statistics associated with each variable. Following this is a list of the independent variables used in the analysis.

SUMMARY TABLE FOR REGRESSION ANALYSIS

A. Orientation

Step Number	Variable Entered		R^2	Increase In R^2	F Value to Enter
	Number	Description			
1	67	workload normalized x % utilization	0.0911	0.0911	34.3852
2	22	no. of new nurses, normalized x % utilization	0.1250	0.0339	13.2478
3	10	% utilization	0.1409	0.0159	6.3188
4	15	(% utilization)^2	0.1566	0.0157	6.3284
5	24	no. of new nurses, normalized x (no. of new nurses)^2	0.1678	0.0111	4.5384
6	44	Region 6 x % new nurses, no experience w/diploma	0.1762	0.0084	3.4613
7	36	% hospital utilization x (no. new nurses normalized)^2	0.1816	0.0054	2.2357
8	60	local government control x workload, normalized	0.1865	0.0049	2.0071
9	64	% new nurses w/no experience x % hospital utilization	0.1918	0.0053	2.2049
10	7	% new nurses w/no experience	0.2149	0.0231	9.8101

B. Inservice

Step Number	Variable Entered		R^2	Increase In R^2	F Value to Enter
	Number	Description			
1	8	% new nurses w/no experience w/ diploma	0.0291	0.0291	10.2786
2	67	workload, normalized x % utilization	0.0456	0.0165	5.8995
3	3	Region 6	0.0625	0.0170	6.1741
4	35	% utilization x local gov't. control	0.0758	0.0133	4.8866

C. Orientation and Inservice Combined

Number	Variable Entered		R^2	Increase In R^2	F Value to Enter
	Number	Description			
1	67	workload, normalized x % utilization	0.0772	0.0772	28.7021
2	3	Region 6	0.1027	0.0255	9.7263
3	8	% new nurses, no experience w/ diploma	0.1219	0.0191	7.4239
4	9	workload, normalized	0.1376	0.0157	6.1894
5	60	local government control x workload, normalized	0.1568	0.0192	7.7263
6	32	% hospital utilization x % new nurses, no experience w/ diploma	0.1669	0.0102	4.1275

INDEPENDENT VARIABLES USED IN THE REGRESSION ANALYSIS

Description	Variable	Question Number
0 or 1 dummy variables		
Region I x_2 = 1 if region I; 0 otherwise	x_2	From hospital ID no.
Region VI x_3 = 1 if region VI; 0 otherwise	x_3	From hospital ID no.
Region VII x_4 = 1 if region VII; 0 otherwise	x_4	From hospital ID no.
Region VIII x_5 = 1 if region VIII; 0 otherwise	x_5	From hospital ID no.
Number of new nurses, normalized[1]	x_6	3
Percent of newly hired nurses with no experience	x_7	4a1
Percent of newly hired nurses with no experience with diplomas	x_8	4a1
Patient days per new nurse day, (new nurse workload) normalized $x \left(\frac{\text{no. new nurses} \times 365}{\text{no. patient days}}\right)$	x_9	3,28
Number of patient days per bed (hospital utilization) x $100 \left(\frac{\text{no. patient days} \times 100}{\text{no. beds} \times 365}\right)$	x_{10}	9,28
Local government control	x_{11}	

[1] Normalized variables: $\frac{x - \bar{x}}{s_x}$

Description	Variable	Description	Variable
$(x_6)^2$	x_{12}	$(x_2) \times (x_7)$	x_{38}
$(x_6)^3$	x_{13}	$(x_2) \times (x_8)$	x_{39}
$(x_9)^2$	x_{14}	$(x_2) \times (x_9)$	x_{40}
$(x_{10})^2$	x_{15}	$(x_2) \times (x_{10})$	x_{41}
$(x_6) \times (x_2)$	x_{16}	$(x_2) \times (x_{11})$	x_{42}
$(x_6) \times (x_3)$	x_{17}	$(x_3) \times (x_7)$	x_{43}
$(x_6) \times (x_4)$	x_{18}	$(x_3) \times (x_8)$	x_{44}
$(x_6) \times (x_5)$	x_{19}	$(x_3) \times (x_9)$	x_{45}
$(x_6) \times (x_8)$	x_{20}	$(x_3) \times (x_{10})$	x_{46}
$(x_6) \times (x_9)$	x_{21}	$(x_3) \times (x_{11})$	x_{47}
$(x_6) \times (x_{10})$	x_{22}	$(x_4) \times (x_7)$	x_{48}
$(x_6) \times (x_{11})$	x_{23}	$(x_4) \times (x_8)$	x_{49}
$(x_6) \times (x_{12})$	x_{24}	$(x_4) \times (x_9)$	x_{50}
$(x_6) \times (x_{13})$	x_{25}	$(x_4) \times (x_{10})$	x_{51}
		$(x_4) \times (x_{11})$	x_{52}
$(x_{10}) \times (x_2)$	x_{26}	$(x_5) \times (x_7)$	x_{53}
$(x_{10}) \times (x_3)$	x_{27}	$(x_5) \times (x_8)$	x_{54}
$(x_{10}) \times (x_4)$	x_{28}	$(x_5) \times (x_9)$	x_{55}
$(x_{10}) \times (x_5)$	x_{29}	$(x_5) \times (x_{10})$	x_{56}
$(x_{10}) \times (x_6)$	x_{30}	$(x_5) \times (x_{11})$	x_{57}
$(x_{10}) \times (x_7)$	x_{31}	$(x_{11}) \times (x_7)$	x_{58}
$(x_{10}) \times (x_8)$	x_{32}	$(x_{11}) \times (x_8)$	x_{59}
$(x_{10}) \times (x_9)$	x_{33}	$(x_{11}) \times (x_9)$	x_{60}
$(x_{10}) \times (x_{10})$	x_{34}	$(x_{11}) \times (x_{10})$	x_{61}
$(x_{10}) \times (x_{11})$	x_{35}	$(x_7) \times (x_8)$	x_{62}

Description	Variable
$(x_7) \times (x_9)$	x_{63}
$(x_7) \times (x_{10})$	x_{64}
$(x_8) \times (x_9)$	x_{65}
$(x_8) \times (x_{10})$	x_{66}
$(x_9) \times (x_{10})$	x_{67}

APPENDIX D

CROSSTABS TABLES

CROSSTABS TABLES

These tables are selected from the computer printouts created by the Crosstabs Program, with titles added. For each item of information, weighted averages were computed for each individual matrix cell. Totals by hospital size group or region are also weighted averages of all data for the cells. Tables are based on responses from 394 hospitals.

Many of the numbers in these tables are carried out to several decimal places. This is done automatically on the printout and does not signify extra precision. Where we felt that the numbers following the decimal impaired readability we have blocked them out.

TABLES

1. Average Number of RNs Hired Per Sample Hospital in Year Reported, by Hospital Size Group and Category of RN

2. Average Length of Orientation Program in Hours Per RN, by Hospital Size Group, Type of Orientation, and Category of RN

3. Average Hourly Salary and Total Salary Cost Per Newly Hired RN for Orientation, by Hospital Size Group and Category of RN

4. Average Annual Staff Hours Per Sample Hospital for Orientation, by Size Group and Region

5. Average Hourly Salary of Training Staff for Orientation, by Size Group and Region

6. Average Annual Salary Costs Per Sample Hospital for Orientation of Newly Hired RNs, by Size Group and Region

7. Data on Inservice Presentations, by Size Group and Region

8. Average Hourly Salary of Participants and Training Staff for Inservice Programs, by Size Group and Region

9. Average Annual Salary Costs Per Sample Hospital for Participants and Training Staff in Inservice Programs, by Size Group and Region

10. Annual Costs Per Sample Hospital for Orientation and Inservice Education, by Size Group and Region: Average Total Cost, Average Cost Per Episode of Illness, and Average Cost Per Patient Day

11. Percent of Respondents Having Orientation and Inservice Programs, by Size Group and Region

12. Time Needed to Find New Inservice Program Director, All Hospitals

13. Percent of Hospitals in Sample Having Diploma Schools, by Size Group

14. Average Percent Source of Revenue Per Sample Hospital, by Size Group

CROSSTABS TABLE 1

AVERAGE NUMBER OF RNS HIRED PER SAMPLE HOSPITAL IN YEAR REPORTED, BY HOSPITAL SIZE GROUP AND CATEGORY OF RN

RN Preparation and Experience	Hospital Size Group					
	Under 100 Beds	100-199	200-299	300-399	400-499	500 and Over
AD	1.300	4.154	7.606	7.897	9.776	19.596
Diploma	0.850	3.531	7.561	12.235	16.224	26.644
BA/BS	0.175	1.703	4.015	5.324	8.449	21.971
Total, In-experienced RNs	2.325	9.369	19.985	26.191	37.180	69.010
Recent Experience	4.375	18.246	28.273	33.603	39.040	60.305
Returning	0.950	1.877	3.231	4.164	5.820	3.590
All RNs	7.625	29.492	51.227	63.221	82.040	132.990

CROSSTABS TABLE 2

AVERAGE LENGTH OF ORIENTATION PROGRAM IN HOURS PER RN,
BY HOSPITAL SIZE GROUP, TYPE OF ORIENTATION, AND CATEGORY OF RN

Type of Orientation and RN Preparation and Experience	Hospital Size Group					
	Under 100 Beds	100-199	200-299	300-399	400-499	500 and Over
Formal: All Newly Hired RNs	21	22	30	33	36	40
Clinical: AD	121	160	138	156	179	160
Clinical: Diploma	77	94	124	118	118	120
Clinical: BA/BS	71	141	121	120	156	140
Clinical: Total, Inexperienced RNs	103	132	131	130	144	137
Clinical: Recent Experience	44	67	64	72	69	78
Clinical: Returning	202	74	79	110	78	137
Clinical: All Newly Hired RNs	63	92	96	103	103	113
Total: Formal and Clinical	84	116	127	137	140	154

CROSSTABS TABLE 3

AVERAGE HOURLY SALARY AND TOTAL SALARY COST PER NEWLY HIRED RN FOR ORIENTATION, BY HOSPITAL SIZE GROUP AND CATEGORY OF RN

RN Preparation and Experience	Hospital Size Group: Under 100 Beds	100-199	200-299	300-399	400-499	500 and Over	Key
AD	3.62	4.10	4.10	4.28	4.43	4.61	A
	494.01	734.55	716.05	816.93	967.96	906.00	B
Diploma	3.62	4.02	4.18	4.21	4.30	4.62	A
	315.93	467.54	668.45	647.43	649.60	739.09	B
BA/BS	3.64	4.26	4.14	4.27	4.38	4.87	A
	314.09	706.14	659.40	670.58	863.16	856.87	B
Total, Inexperienced RNs	3.62	4.10	4.13	4.25	4.35	4.69	A
	415.43	631.29	694.42	701.29	755.46	819.82	B
Recent Experience	3.96	4.43	4.49	4.55	4.55	4.90	A
	198.40	401.55	417.57	471.27	469.80	569.94	B
Returning	3.98	4.14	4.25	4.42	4.67	4.36	A
	1030.52	356.52	430.63	660.19	506.71	755.33	B
All RNs	3.87	4.30	4.34	4.42	4.55	4.78	A
	279.34	498.98	550.28	610.19	635.66	730.36	B

A = Average hourly salary per new RN.
B = Average salary cost per new RN for orientation.

CROSSTABS TABLE 4

AVERAGE ANNUAL STAFF HOURS PER SAMPLE HOSPITAL FOR ORIENTATION, BY SIZE GROUP AND REGION

Census Region	Hospital Size Group					
	Under 100 Beds	100-199	200-299	300-399	400-499	500 and Over
I	868.000	2800.800	2840.000	3360.000	2070.000	6168.000
II	2640.000	1673.333	2660.000	1569.000	1662.857	5206.125
III	1758.000	2066.667	2281.200	2614.909	2230.667	6557.000
IV	530.000	2185.500	2836.000	3893.455	4106.000	6358.667
V	684.000	2724.000	2880.000	3172.000	2152.000	6536.000
VI	600.000	614.000	2346.000	3427.500	1912.000	5390.400
VII	384.000	2599.500	2580.000	3445.000	960.000	4723.200
VIII	880.000	1118.400	771.000	1104.000	1776.000	4380.000
IX	1062.000	2586.000	1062.000	1828.500	2082.000	2802.000
All Regions	837.882	2062.125	2399.636	2850.176	2480.400	5587.886

CROSSTABS TABLE 5

AVERAGE HOURLY SALARY OF TRAINING STAFF FOR ORIENTATION,
BY SIZE GROUP AND REGION

Census Region	Hospital Size Group					
	Under 100 Beds	100-199	200-299	300-399	400-499	500 and Over
I	4.17	5.63	5.55	5.61	5.46	6.93
II	4.77	5.48	5.25	5.53	5.37	6.88
III	4.89	5.15	5.16	5.81	5.78	5.51
IV	5.04	5.60	5.64	5.16	6.28	5.57
V	4.45	4.85	4.77	5.05	5.09	6.32
VI	4.21	5.55	5.13	5.28	5.71	5.60
VII	5.00	4.98	5.41	4.95	4.43	5.52
VIII	4.48	5.20	4.80	5.28	6.65	5.13
IX	4.44	6.26	5.79	6.41	7.11	7.02

CROSSTABS TABLE 6

AVERAGE ANNUAL SALARY COSTS PER SAMPLE HOSPITAL FOR ORIENTATION OF NEWLY HIRED RNS, BY SIZE GROUP AND REGION

Census Region	Hospital Size Group: Under 100 Beds	100-199	200-299	300-399	400-499	500 and Over	All Size Groups	Key
I	4681.	15541.	25190.	49621.	67803.	176810.	36955.	A
	3619.	15776.	16036.	18865.	11305.	42906.	18655.	B
	8301.	31317.	41197.	68486.	79108.	219610.	55611.	C
II	603.	14383.	28511.	36178.	47304.	111242.	63811.	A
	12593.	9334.	13947.	10685.	9774.	35861.	21068.	B
	13196.	23717.	42498.	46864.	57138.	147103.	84880.	C
III	2595.	9680.	26919.	41810.	64915.	81929.	45134.	A
	8610.	16656.	11772.	15600.	12936.	36173.	18021.	B
	11205.	26337.	38692.	57410.	77821.	118102.	63155.	C
IV	2413.	14529.	30353.	39163.	50027.	113695.	60483.	A
	2673.	12248.	16284.	20102.	25835.	35451.	23650.	B
	5088.	26778.	46637.	59266.	75903.	149146.	84133.	C
V	3663.	10345.	36042.	46647.	34408.	69215.	35344.	A
	3049.	13229.	13756.	14138.	11096.	14136.	11935.	B
	6713.	23614.	49848.	60795.	46375.	110532.	54701.	C
VI	1648.	6425.	26220.	33533.	43607.	66234.	33268.	A
	2527.	3413.	12057.	11810.	10933.	13022.	11426.	B
	4176.	9838.	38258.	45163.	54543.	79455.	44752.	C
VII	1315.	20882.	16357.	33895.	35913.	92296.	45631.	A
	1742.	12965.	13967.	11807.	14253.	26103.	16945.	B
	3057.	33848.	50324.	59197.	39672.	118399.	62577.	C
VIII	4267.	11038.	14965.	37865.	23919.	92621.	27999.	A
	3228.	5816.	3708.	5835.	11810.	22500.	8032.	B
	7496.	16854.	18358.	43641.	35729.	75121.	36031.	C
IX	1907.	24862.	15334.	35515.	64649.	82027.	33804.	A
	4775.	16191.	6148.	11732.	14806.	19677.	12221.	B
	6683.	41053.	21483.	47247.	79455.	101704.	46026.	C
All Regions	2501.	15033.	28189.	34743.	52149.	97132.	47519.	A
	3738.	11358.	12826.	15593.	15061.	33746.	18261.	B
	6240.	26391.	41016.	54336.	67210.	130878.	65780.	C

A = Total annual salary costs for all new RNs for orientation.
B = Total annual salary costs for training staff for orientation.
C = Total annual salary costs (new RNs plus staff) for orientation.

CROSSTABS TABLE 7

DATA ON INSERVICE PRESENTATIONS, BY SIZE GROUP AND REGION

Census Region	Hospital Size Group: Under 100 Beds	100-199	200-299	300-399	400-499	500 and Over	Key
I	19.3	74.6	125.7	80.5	278.0	175.2	A
	1.66	1.00	1.00	2.71	1.5^	2.50	B
	10.3	12.4	18.2	18.0	14.0	15.5	C
	436.0	2716.8	2049.3	3742.2	1116.0	6012.0	D
II	130.0	56.0	83.9	83.9	67.2	179.0	A
	1.00	1.05	1.03	1.16	1.07	1.57	B
	16.0	19.5	26.7	29.0	29.1	33.0	C
	354.0	1429.3	3605.6	4124.0	1254.8	10299.7	D
III	29.3	36.1	81.8	166.9	195.1	229.8	A
	1.00	1.16	.87	1.22	.90	1.27	B
	7.6	12.1	21.4	16.9	72.5	24.3	C
	1892.0	1950.6	2173.2	4164.0	5400.0	4102.9	D
IV	51.4	108.2	107.4	132.8	136.2	188.9	A
	.92	1.12	1.08	.86	1.08	1.29	B
	11.6	20.0	35.1	45.9	29.3	33.5	C
	405.6	2194.5	3575.0	2364.0	5567.0	4540.8	D
V	24.0	72.0	178.5	167.0	88.3	77.0	A
	1.00	1.50	.75	1.00	1.33	1.83	B
	7.3	17.0	12.0	22.5	15.0	29.0	C
	996.0	1233.0	1314.0	1908.0	3216.0	4572.0	D
VI	14.8	24.3	149.5	76.0	203.7	160.2	A
	1.17	1.00	1.08	1.00	1.33	1.15	B
	9.5	25.5	21.1	15.5	25.6	31.6	C
	236.5	762.0	1418.0	1659.0	1957.3	3358.8	D
VII	44.0	100.1	62.0	121.5	116.0	237.2	A
	1.00	1.00	1.75	1.25	1.00	.95	B
	11.3	12.6	15.5	32.0	5.0	19.4	C
	295.0	2548.0	1578.0	2730.0	1392.0	9568.8	D
VIII	23.2	93.8	169.0	105.0	200.0	328.3	A
	1.12	1.00	1.37	1.00	1.50	1.16	B
	12.2	13.4	11.0	14.0	20.0	17.6	C
	630.0	1555.2	1776.0	1332.0	2952.0	9464.0	D
IX	26.1	175.2	150.1	273.7	392.3	105.0	A
	1.66	1.18	.91	1.06	1.25	2.75	B
	9.8	25.6	42.0	14.7	56.6	61.2	C
	692.0	2246.5	3500.0	3784.5	5280.0	7560.0	D
All Regions	33.9	87.6	112.9	131.5	183.7	189.1	A
	1.20	1.10	1.04	1.25	1.15	1.44	B
	10.4	18.1	25.4	24.9	37.5	30.6	C
	609.0	1919.6	2720.5	3246.1	3794.1	5951.9	D

A = Mean number of inservice presentations per year.
B = Average length of inservice presentations in hours.
C = Average number of RNs attending presentation.
D = Average total training staff hours per year for inservice education.

CROSSTABS TABLE 8

AVERAGE HOURLY SALARY OF PARTICIPANTS AND TRAINING STAFF FOR INSERVICE PROGRAMS, BY SIZE GROUP AND REGION

Census Region	Hospital Size Group: Under 100 Beds	100-199	200-299	300-399	400-499	500 and Over	Key
I	3.91	4.42	4.90	5.43	5.12	5.32	A
	4.77	5.76	5.50	6.15	5.95	6.83	B
II	4.07	4.50	5.10	5.08	5.35	6.11	A
	4.90	5.38	6.32	6.40	5.51	7.40	B
III	4.38	4.54	4.71	4.82	4.78	4.91	A
	4.97	5.50	5.66	5.78	6.45	6.19	B
IV	4.51	5.33	5.00	4.73	5.24	4.99	A
	5.48	5.66	6.21	5.48	6.40	5.98	B
V	4.39	4.40	4.51	4.61	4.54	4.86	A
	4.37	4.96	4.63	5.05	5.79	6.04	B
VI	4.01	4.22	4.56	4.44	5.25	4.97	A
	4.15	5.81	5.08	5.55	5.49	5.74	B
VII	4.60	4.78	4.69	4.18	5.06	4.81	A
	5.00	5.06	5.18	5.75	4.62	5.30	B
VIII	4.32	4.63	4.22	4.62	5.10	4.44	A
	4.49	5.40	4.89	5.75	6.45	5.35	B
IX	5.64	5.39	5.05	5.42	5.55	5.80	A
	6.20	6.37	5.37	6.57	7.67	7.69	B

A = Average hourly salary per inservice participant.
B = Average hourly salary per training staff member.

CROSSTABS TABLE 9

AVERAGE ANNUAL SALARY COSTS PER SAMPLE HOSPITAL
FOR PARTICIPANTS AND TRAINING STAFF
IN INSERVICE PROGRAMS, BY SIZE GROUP AND REGION

Census Region	Hospital Size Group: Under 100 Beds	100-199	200-299	300-399	400-499	500 and Over	Key
I	1059.	4226.	8178.	11446.	13748.	19765.	A
	2084.	15634.	11277.	23048.	6646.	41071.	B
	3143.	19881.	19456.	34494.	20395.	60836.	C
II	8692.	4067.	10002.	12552.	8703.	33257.	A
	764.	7695.	22745.	26349.	6921.	76260.	B
	9456.	11762.	32798.	38951.	15625.	109517.	C
III	1527.	2410.	6349.	12313.	23112.	31770.	A
	14037.	10735.	12312.	24103.	34874.	26471.	B
	15565.	13146.	18662.	36421.	57987.	59241.	C
IV	1378.	7751.	16141.	8422.	15927.	41644.	A
	2223.	11435.	22216.	12961.	35991.	27160.	B
	3601.	19237.	38358.	21384.	51919.	68804.	C
V	841.	7810.	4715.	17067.	9671.	21530.	A
	4359.	6120.	6039.	9636.	18634.	27358.	B
	5200.	13931.	10805.	26704.	28305.	49188.	C
VI	521.	2746.	9608.	6114.	28851.	13353.	A
	983.	4434.	7214.	9159.	11534.	19291.	B
	1505.	7180.	16823.	15273.	40386.	33145.	C
VII	2543.	7767.	6688.	17668.	2935.	14286.	A
	1620.	13170.	8188.	15726.	6431.	50735.	B
	4163.	20938.	14876.	33388.	9366.	65022.	C
VIII	1601.	5890.	10527.	7870.	30600.	18572.	A
	4049.	4404.	8701.	7660.	19043.	51703.	B
	5650.	14295.	19229.	15536.	49640.	69276.	C
IX	2931.	15260.	14852.	14559.	60197.	45450.	A
	5120.	14869.	18814.	24886.	40529.	58143.	B
	8050.	30129.	33666.	39446.	100726.	103593.	C
All Regions	1697.	6755.	10492.	11507.	23419.	30765.	A
	3436.	10662.	15950.	19630.	24717.	46316.	B
	5134.	17418.	26442.	31138.	48136.	77082.	C

A = Total annual salary costs for participants in inservice education.
B = Total annual salary costs for training staff for inservice education.
C = Total annual salary cost for participants and staff for inservice education.

CROSSTABS TABLE 10

ANNUAL COSTS PER SAMPLE HOSPITAL FOR ORIENTATION AND INSERVICE EDUCATION BY SIZE GROUP AND REGION: AVERAGE TOTAL COST, AVERAGE COST PER EPISODE OF ILLNESS, AND AVERAGE COST PER PATIENT DAY

Census Region	Hospital Size Group: Under 100 Beds	100-199	200-299	300-399	400-499	500 and Over	All Size Groups	Key
I	11444.0	51198.6	60653.6	102981.	99523.5	185447.	82595.7	A
	4.706	7.190	7.011	9.151	6.125	6.820	7.225	B
	.690	1.046	.906	1.014	.680	.742	.903	C
II	22652.0	34802.7	72400.2	83816.2	72763.8	261584.	147241.	A
	7.410	5.355	8.112	7.015	8.368	11.599	8.673	B
	1.020	.698	.946	.774	.484	.996	.865	C
III	26770.5	33483.7	57355.1	88937.2	134233.	167937.	96324.3	A
	9.660	5.728	6.314	5.995	7.971	7.451	6.807	B
	1.095	.681	.823	.823	.942	.802	.822	C
IV	8089.6	46430.6	86377.5	187269.5	1127822.	1217951.	130559.	A
	2.651	7.730	8.229	6.399	8.474	10.793	8.451	B
	.390	1.023	1.090	.909	.968	1.088	.967	C
V	11913.3	36877.3	90653.0	114660.	154982.0	159720.	76403.2	A
	5.580	5.976	7.975	7.245	3.235	5.903	5.952	B
	.843	1.076	.930	1.075	.335	.826	.861	C
VI	9881.0	16535.2	55091.5	66910.6	94671.3	1127148.	67207.4	A
	7.894	9.332	6.783	4.826	5.997	4.870	6.252	B
	.991	.914	.813	.667	.732	.533	.753	C
VII	5832.6	46977.1	35200.5	85362.5	149034.0	1194432.	98350.8	A
	2.850	7.431	3.191	5.285	2.500	7.456	6.173	B
	.763	1.152	.465	.749	.350	.984	.902	C
VIII	11452.3	31150.0	67587.5	59177.5	185369.0	1144397.	60965.2	A
	3.430	5.928	5.397	3.695	5.850	5.796	5.119	B
	.630	.992	.935	.620	.830	.826	.841	C
IX	15538.0	71182.3	55150.0	46693.8	1180191.	1238053.	94979.3	A
	22.986	9.008	5.641	6.192	11.115	12.176	10.292	B
	2.568	1.541	1.003	.913	1.579	1.446	1.470	C
All Regions	11033.7	43282.2	66666.188	85729.3	114990.	213411.	106582.	A
	7.940	7.142	6.94703	6.472	7.186	9.408	7.683	B
	1.048	1.026	.92297	.818	.874	.949	.933	C

A = Total annual cost for orientation and inservice education.
B = Cost of orientation and inservice education per episode of illness.
C = Cost of orientation and inservice education per patient day.

CROSSTABS TABLE 11

PERCENT OF RESPONDENTS HAVING ORIENTATION AND INSERVICE PROGRAMS, BY SIZE GROUP AND REGION

Hospital Size Group

Census Region	Under 100 Beds	100-199	200-299	300-399	400-499	500 and Over	All Size Groups	Key
I	66.667	100.000	100.000	100.000	100.000	100.000	96.667	A
	66.667	100.000	100.000	100.000	100.000	100.000	96.667	B
II	50.000	88.889	93.333	100.000	100.000	100.000	96.250	A
	100.000	77.778	100.000	100.000	100.000	100.000	97.500	B
III	66.667	88.889	100.000	100.000	100.000	100.000	96.296	A
	66.667	88.889	100.000	100.000	88.889	100.000	94.444	B
IV	100.000	100.000	100.000	100.000	100.000	100.000	100.000	A
	100.000	100.000	100.000	90.909	100.000	96.296	97.368	B
V	100.000	100.000	100.000	100.000	100.000	100.000	100.000	A
	25.000	100.000	100.000	100.000	100.000	100.000	83.333	B
VI	75.000	83.333	100.000	100.000	100.000	100.000	93.617	A
	87.500	83.333	100.000	100.000	100.000	100.000	95.745	B
VII	50.000	87.500	100.000	100.000	100.000	100.000	89.655	A
	75.000	100.000	100.000	100.000	100.000	100.000	96.552	B
VIII	75.000	100.000	100.000	100.000	100.000	100.000	94.737	A
	100.000	100.000	100.000	100.000	100.000	100.000	100.000	B
IX	83.333	100.000	100.000	100.000	100.000	100.000	97.561	A
	50.000	100.000	100.000	100.000	83.333	100.000	90.244	B
All Regions	77.500	93.846	98.485	100.000	100.000	100.000	96.447	A
	75.000	93.846	100.000	98.529	96.000	99.048	95.431	B

A = Percent having orientation programs.
B = Percent having inservice programs.

CROSSTABS TABLE 12

TIME NEEDED TO FIND INSERVICE PROGRAM DIRECTOR, ALL HOSPITALS

Immediately	68	68	Number of Hospitals
	18.182	18.182	% of Total
2-3 Months	206	206	Number of Hospitals
	55.080	55.080	% of Total
Over 3 Months	100	100	Number of Hospitals
	26.738	26.738	% of Total

CROSSTABS TABLE 13

PERCENT OF HOSPITALS IN SAMPLE HAVING DIPLOMA SCHOOLS, BY SIZE GROUP

Hospital Size Group

	Under 100 Beds	100-199	200-299	300-399	400-499	500 and Over	All Size Groups	Key
YES		2	16	26	20	48	112	No. of Hospitals
		3.077	24.242	38.235	40.000	45.714	29.426	% of Total
NO	40	63	50	42	30	57	282	No. of Hospitals
	100.000	96.923	75.758	61.765	60.000	54.286	71.574	% of Total

CROSSTABS TABLE 14

AVERAGE PERCENT SOURCE OF REVENUE PER SAMPLE HOSPITAL BY SIZE GROUP

Hospital Size Group

	Under 100 Beds	100-199	200-299	300-399	400-499	500 and Over
Blue Cross	21.185	21.035	25.678	27.000	23.326	23.568
Other Private	19.185	27.236	22.136	22.190	27.717	21.479
Medicare	38.370	31.228	32.492	30.898	28.174	27.368
Medicaid	8.519	7.930	7.966	7.724	9.478	13.326
Other	14.360	14.453	12.105	12.930	12.630	14.890

☆ U. S. GOVERNMENT PRINTING OFFICE : 1977